THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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Armor Plate Sawing.

Modern armor plate presents formidable difficulties to the designers of tools for its machining. The initial high carbon of the material and the introduction of large percentages of nickel and other hardeners make it extremely tough even in its softer state, but when, as is frequently necessary, the plate is put through the process of hardening before machining the result is a resistance to cutting so stubborn that any but extraordinary means are totally useless. Planing machines, slotters and drill presses of a size and power beyond anything formerly contemplated are now built for this purpose, yet the strongest of these are overpowered when their effectiveness depends upon the rigidity of cutting tools projecting necessarily some distance beyond their points of support. As the support varies with the position and depth of the cut, whatever the power of the drive, only such effectiveness can be secured as lies within the limit of the backward springing of the cutting tool. This limitation of straight line cutting tools has led to the adoption of a system of slotting and planing by means of rotating cutters, with which a closer support of the cutting tools up to the cut is possible, and tool springing is practically eliminated.

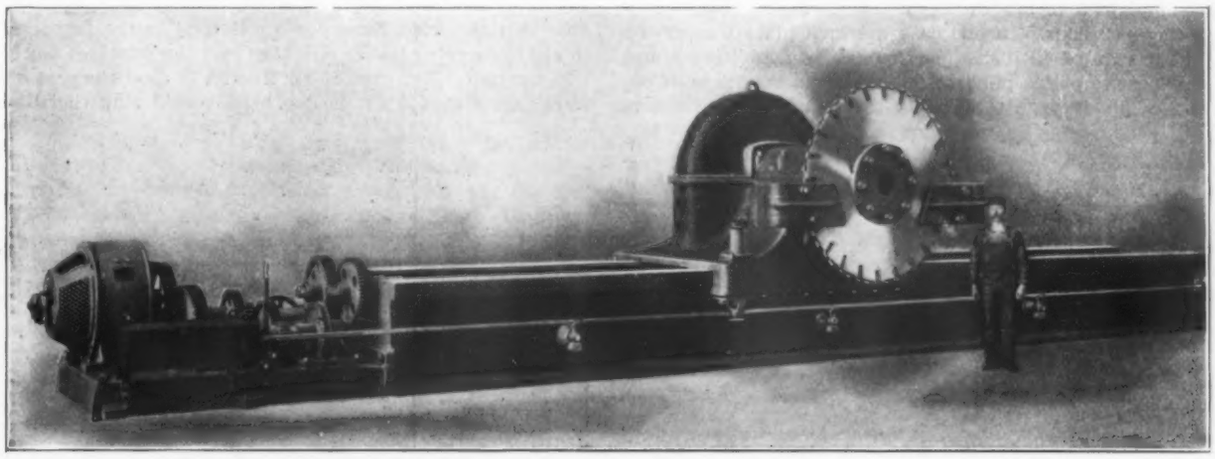


Fig. 1.—Armor Plate Cold Saw at the Midvale Steel Company.—Machine Built by Niles-Bement-Pond Company; Saw Blade by Tindel-Morris Company.

Herewith is illustrated a machine for sawing armor plate recently built by the Niles-Bement-Pond Company, New York, for the Midvale Steel Company, equipped with a Tindel high duty saw specially made for the machine by the Tindel-Morris Company, Eddystone, Pa. A machine of substantially the same type has been installed for planing work.

It will be seen from Fig. 1 that the machine is of massive construction. The saw is fed to the work, its carriage moving on broad, flat ways being traveled by a heavy lead screw. The carriage feeds are varied by change gears and range from 0.15 to 1 inch per revolution of the saw blade. The mandrel carrying the saw blade is fitted into boxes with provision for taking up wear. It is driven by a Hendley worm meshing, with a large worm wheel fixed on the back end of the mandrel, and on the front end carries a solid forged collar, to which the saw blade is attached by eight 2-inch through bolts arranged in a circle 25 inches in diameter. Change gears are provided for six peripheral speeds of the saw ranging from 10 to 40 feet per minute. The power is supplied by a 50 horse-power electric motor geared direct to the machine, as shown in the illustration.

The saw blade with its inserted cutters is a novel feature of the machine and is the invention of Adam Tindel of the Tindel-Morris Company. It is characterized by a very simple construction and preservation of the strength of the saw blade by keeping it solid throughout, especially at the cutter seats. No slots are cut through the plate. The cutters are imbedded but half way in the plate, the alternate ones being on one side and the intermediate ones on the other. Besides preserving a solid plate an advantage of this design is that the side thrust of the cutters is taken up by a solid backing. Another important gain in the construction is that of dividing the cut into halves and thus economizing power.

The saw in action cutting armor plate is shown in Fig. 2, and a detail section showing the manner of inserting cutters in the drawing Fig. 3. It will be seen that the essential features of it are a steel plate 1⅛ inches thick by 70 inches in diameter, milled half way through alternately on each side with the undercut rectangular slots A. They are raked backward 20 degrees from a radial line, C. At the inner ends the slots are milled deeper into the plate so that when the cutters, slightly thicker than the depth of the slot, are bedded and driven home they have an outward inclination at the cutting end of 1 degree beyond the saw plate. This

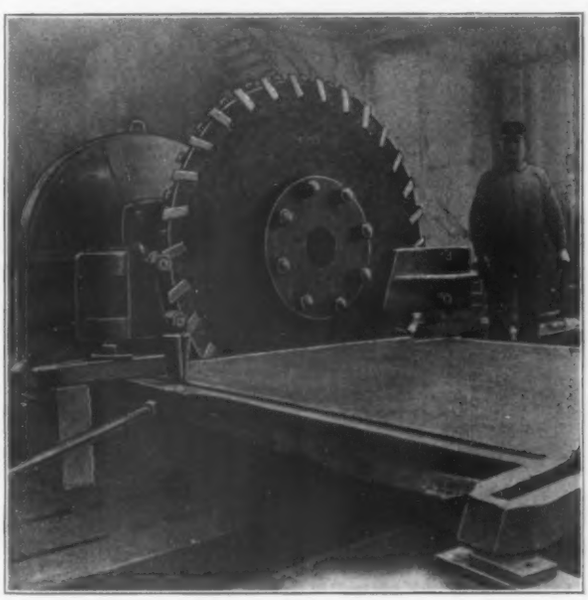


Fig. 2.—A Nearer View of the Tindel Saw at Work.

gives clearance to the cutters, allowing the saw blade to run entirely clear of the work without any surface friction. All power reaching the saw blade is therefore expended in cutting alone.

The slots as thus milled retain the cutters without any keeper or fastener. The cutters are forgings of high speed steel ground bevel on the edges to fit the slots into which they are driven. The direction of the pressure in cutting being inward there is no tendency of the cutters to draw or loosen. The dimensions of the slots and cutters as well as the angles of their insertion are shown in detail in Fig. 3. At the ends the cutters are ground to an angle of 66 degrees with their longest dimension. It is found that this is an effective angle for a clean parting cut, that does not weaken the cutting edges for the severest work. The cutters project only 1½ inches beyond the plate, which is sufficient to avoid spring or vibration. The total diameter of the saw with the cutters inserted is 73 inches. With this machine and saw blade armor plate 4½ inches thick, previously hardened, is cut at a feed of 9 inches per hour. Unhardened nickel steel plate 5 inches thick was handled at a feed of 40 inches per hour. In one case a 4-inch plate was sawed at the rate of 49 inches per hour. By doubling up and sawing two plates piled so as to make a thickness of 8½ inches an average feed of 14 to 19 inches per hour is

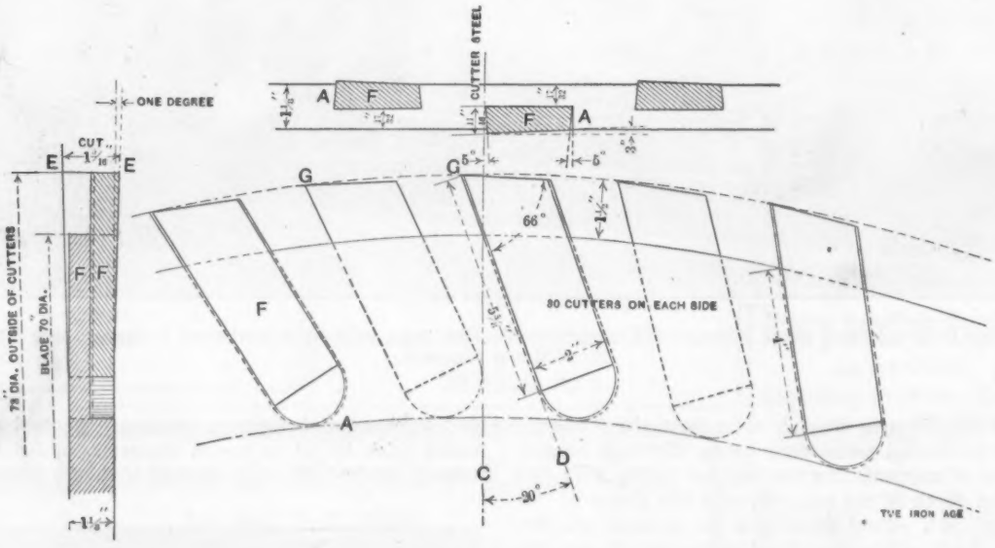


Fig. 3.—Details of the Tindel-Morris Saw Blade.

obtained. The following are a few day to day records of the performance of this machine:

Material, 4½-inch plate; peripheral speed of saw, 12 feet per minute; feed per revolution, 3-16 inch; rate of cutting, 9 inches per hour.

Material, 4½-inch plate; peripheral speed of saw, 15 feet per minute; feed per revolution, 5-16-inch; feed per minute, 3-10 inch; rate of cutting, 18 inches per hour.

Material, 7½-inch plate; peripheral speed of saw, 12 feet per minute; feed per revolution, 3-16 inch; feed per minute, 3-20 inch; rate of cutting, 9 inches per hour.

Material, 5-inch nickel steel plate; peripheral speed of saw, 40 feet per minute; feed per revolution, 5-16 inch; feed per minute, 2-3 inch; rate of cutting, 40 inches per hour.

Material, two 4¼-inch plates, 5 per cent. nickel steel, 8½ inches thick by 7 feet long; cut at the rate of 17 inches per hour.

Material, three shields, 4¼ inches thick by 57 inches long; cut at the rate of 10 inches per hour.

Material, 4¼-inch plate by 15 feet long; cut at the rate of 23 inches per hour. (The saw made a cut of 50½ feet without grinding.)

Material, 4-inch plate, 15 feet long; cut at the rate of 32 inches per hour.

Material, two 4¼-inch plates, 5 per cent. nickel steel, 8½ inches thick; cut at the rate of 14 inches per hour.

Material, two of the same plates as above; cut at the rate of 19 inches per hour.

Material, 4-inch mild plate; cut at the rate of 49 inches per hour. (Saw made cut of 45 feet without grinding.)

The endurance of the high speed steel cutters, which were made by the Midvale Company, is shown by the fact that as much as 50 feet length of cut has been taken without regrinding them.

Tne Lake Superior-Colorado Ore Deal.

DULUTH, MINN., August 18, 1905.—The 100,000 tons of Hibbing, Mesaba range, iron ore that is now being shipped to the Minnequa furnaces of the Colorado Fuel & Iron Company is paying a freight of $4.50 a gross ton. This ore is hauled over the Great Northern road from the Stevenson mine to Sioux City, the Chicago & Northwestern to Omaha, the Burlington & Missouri Valley to Denver and the Denver & Rio Grande to Minnequa, a total distance of 1273 miles. The ore costs at mine $2.15, f.o.b., which is the Cleveland charge less the combined lake and rail rate from the Mesaba range to Lake Erie ports, and there is therefore no concession in price by the mining company.

The rate of $4.50 a ton is an especially low charge for the distance hauled, prorated over four roads, and figures out at 3.1 mills per net ton-mile. It is not probable that any Western roads ever made a combined rate for so low a figure. With this rate the iron ore going into a ton of steel rails, for instance, will cost the maker, if he uses this ore alone, almost $13.25 a ton. Of course it is probable that this rich Bessemer ore is used in the furnaces to aid in carrying leaner ores that cost the furnaces much less per unit. But even if all Mesaba is used the cost of steel ingots should not be too high, considering the fact that they will originate in Colorado, for conversion into rails at a very profitable figure, so far as the Colorado Fuel & Iron Company is concerned.

The remarkable thing about this contract is in the rail rate made on the ore. This ore is being hauled in 50-ton steel cars, good for almost no other class of freight, and it will probably tie up 400 or 500 of them continuously. The Great Northern is the only road engaged in the traffic that has the cars to use, and it would seem to an outsider that these could earn a bigger return if engaged in the Lake Superior trade exclusively or in that from Butte to smelters and concentrators at Anaconda, Great Falls and Basin.

It is understood among iron ore men that the latest underground properties of the Colorado Fuel & Iron Company, near Sunrise, Wyo., now being extensively developed, will in the course of the coming year provide a source of supply that will obviate the need of Eastern ores. Some figuring is now going on in connection with the rich ores of Madera County, Cal., which are located about 1400 miles from Minnequa, and it is possible that these may be hauled to the Colorado furnaces. It is probable that the Santa Fé and Huntington interests combined will shortly have road connection to these ore deposits. D. E. W.

Arrangements are being made for a competitive exhibition in Germany in October of freight and omnibus automobiles. Foreign autos will be admitted.

Railroad Statistics for the Fiscal Year 1904.

From summaries which will be included in the seventeenth annual statistical report of the Interstate Commerce Commission, prepared by its statistician as the complete report for the year ending June 30, 1904, the figures in this abstract are obtained. This report is in general similar to preceding reports in the series, and will constitute a volume of about 700 pages. The several tables containing details of mileage, capitalization, earnings, expenses, &c., by roads form the bulk of the report, though the text contains many summaries of railway statistics.

Mileage.

The total single track mileage in the United States on June 30, 1904, was 213,904.34 miles, having increased 5927.12 miles in the year ending on that date. This increase exceeds that of any previous year since 1890.

The aggregate length of railroad mileage, including tracks of all kinds, was 297,073.34 miles, being classified as follows: Single track, 212,243.20 miles; second track, 15,824.04 miles; third track, 1467.14 miles; fourth track, 1046.50 miles, and yard track and sidings, 66,492.46 miles. Thus it appears that there was an increase of 13,251.82 miles in the aggregate length of all tracks, of which 4932.40 miles, or 37.22 per cent., were due to the extension of yard track and sidings. The number of railroad corporations included in the report was 2104. In the course of the year companies owning 5600.18 miles of line were reorganized, merged, consolidated, &c. For the year 1903 the corresponding item was 10,486.37 miles.

Then length of mileage operated by receivers on June 30, 1904, was 1323.28 miles, showing an increase of 137.83 miles, as compared with the previous year. The number of roads in the hands of receivers was 28, and at the close of the previous year 27.

Equipment.

On June 30, 1904, there were in the service of the railroads 46,743 locomotives, the increase being 2872. As classified, these locomotives were: Passenger, 11,252; freight, 27,029; switching, 7610. There were also 852 not assigned to any class.

The total number of cars of all classes was 1,798,561, this total having increased 45,172 during the year. The assignment of this rolling stock was, to the passenger service, 39,752 cars; to the freight service, 1,692,194 cars; the remaining 66,615 cars being those employed directly by the railroads in their own service. Cars used by the railroads that were owned by private companies and firms are not included in this statement.

Only 602 cars in passenger service were without automatic couplers. Of 1,692,194 cars in freight service 1,434,386 had train brakes and 1,674,427 automatic couplers.

Employees.

The number of persons on the pay rolls of the railroads was 1,296,121, or 611 per 100 miles of line. These figures, when compared with corresponding ones for the year 1903, show a decrease of 16,416 in the number of employees, or 28 per 100 miles of line. The classification includes, enginemen, 52,451; firemen, 55,004; conductors, 39,645, and other trainmen, 106,734. There were 46,262 switch tenders, crossing tenders and watchmen. The amount of wages and salaries paid to employees during the year was $817,598,810.

Capitalization.

The par value of the amount of railroad capital outstanding on June 30, 1904, was $13,213,124,679, which represents a capitalization of $64,265 per mile. Of this capital $6,339,899,329 existed as stock, of which $5,050,529,469 was common and $1,289,369,860 preferred, and the remaining part, $6,873,225,350 as funded debt, which consisted of mortgage bonds, $5,746,898,983; miscellaneous obligations, $723,114,986; income bonds, $229,876,687, and equipment trust obligations, $173,334,694. Current liabilities are not included in capital. Current liabilities for the year amounted to $881,628,720, or $4288 per mile of line.

Of the total capital stock outstanding $2,696,472,010, or 42.53 per cent., paid no dividends. The amount of dividends declared during the year was $221,941,049, being equivalent to 6.09 per cent. on dividend paying stock. For the year ending June 30, 1903, the amount of dividends declared was $196,728,176. The amount of funded debt (omitting equipment trust obligations) that paid no interest was $300,894,215, or 4.49 per cent.

Public Service.

The number of passengers reported as carried by the railroads in the year ending June 30, 1904, was 715,419,682, indicating an increase of 20,528,147, as compared with the year ending June 30, 1903.

The number of tons of freight reported as carried (including freight received from connecting roads and other carriers) was 1,309,899,165, which exceeds the tonnage of the previous year by 5,504,842 tons. The ton mileage, or the number of tons carried 1 mile, was 174,522,089,577, the increase being 1,300,810,584. The number of tons carried 1 mile per mile of line was 829,476.

The average revenue per passenger per mile for the year mentioned was 2.006 cents, the average for the preceding year being the same. The average revenue per ton per mile was 0.780 cent. The average for the preceding year was 0.763 cent. The average cost of running a train 1 mile appears to have increased between 4 and 5 cents. The ratio of operating expenses to earnings, 67.79 per cent., also increased in comparison with the preceding year, when it was 66.16 per cent.

Earnings and Expenses.

The gross earnings from the operation of 212,243.20 miles of line were $1,975,174,091, being $74,327,184 greater than for the previous year. The operating expenses were $1,338,896,253, or $81,357,401 more than in 1903. Gross earnings from operation per mile of line averaged $9306, the corresponding average for the year 1903 being $48 less.

The income from operation, or the net earnings, amounted to $636,277,838, a decrease of $7,030,217. Net earnings per mile for 1904 averaged $2998; for 1903, $3133. The amount of income obtained from other sources than operation was $212,933,990. In this amount are included the following items: Income from lease of road, $109,694,361; dividends on stocks owned, $44,969,794; interest on bonds owned, $18,702,245, and miscellaneous income, $39,567,590..

The amount of dividends declared during the year (including $115,546, other payments from net income) was $222,056,595, leaving as the surplus from the operations of the year $56,729,331, that of the previous year having been $99,227,469.

Casualties.

The total number of casualties to persons for the year was 94,201, of which 10,046 represented the number of persons killed and 84,155 the number injured. Casualties occurred among three general classes of employees, as follows: Trainmen, 2114 killed and 29,275 injured; switch tenders, crossing tenders and watchmen, 229 killed, 2070 injured; other employees, 1289 killed, 35,722 injured. The number of passengers killed in the course of the year 1904 was 441 and the number injured 9111. In the previous year 355 passengers were killed and 8231 injured. The total number of persons, other than employees and passengers, killed was 5973; injured, 7977. These figures include the casualties to persons classed as trespassing.

The United States Transportation Company, Syracuse, N. Y., has given the American Shipbuilding Company a contract for a freight steamer to be a duplicate of the Elbert H. Gary, recently built for the Pittsburgh Steamship Company. Water ballast capacity of 8500 tons will be provided. There will be 34 hatches, 12 feet centers. The steamer will be 569 feet long over all, 549 feet keel, 56 feet beam and 31 feet depth of hold. The carrying capacity will be 12,000 tons. The American Shipbuilding Company has also contracted to build a freight steamer 545 feet over all and 55 feet beam for the Hawgood interests of Cleveland. This makes 14 vessels booked by the company for delivery in 1906. Other steamers are under negotiation.

The Niles Extra Heavy Driving Wheel Lathe.

The locomotive driving wheel chucking lathe illustrated herewith and built by the Niles Tool Works of the Niles-Bement-Pond Company, New York, is intended for extra heavy work. It is designed to take two cuts ½ inch deep with a 3-16-inch feed at a speed of 20 feet per minute in steel tires, removing about 540 pounds of metal per hour, and in actual practice has done even better. In a day of ten hours it is capable of turning six pairs of driving wheel tires, which is about three times the average capacity of the best older types of machines.

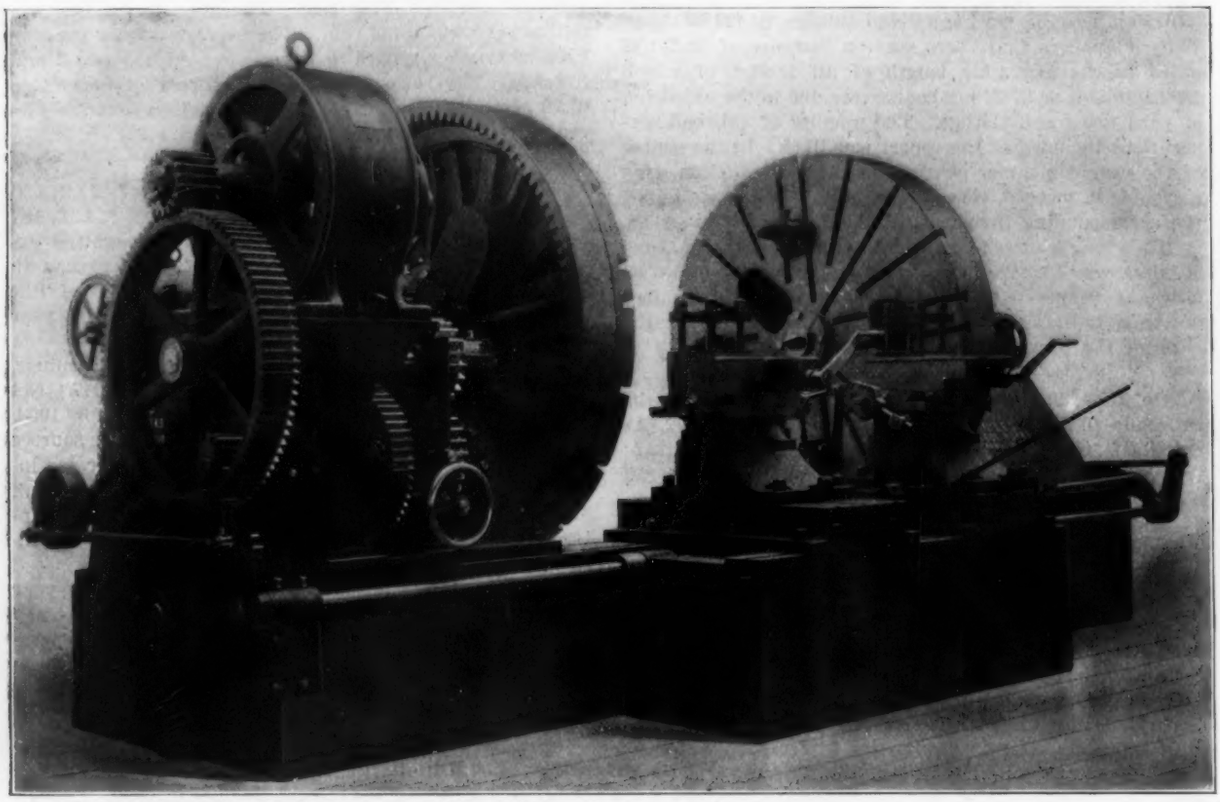
The manner of holding the work is one of the special points of individuality of the lathe. On each face plate, as may be seen from the engraving, are mounted four patent "sure grip" drivers. The wheels are bolted firmly against these drivers and wedges are driven in, forcing the saw teeth of the drivers directly into the outside faces of the tire rims. By this means the wheels are held absolutely rigid under the heaviest cuts and chattering is eliminated, such as is likely to result when the driving is through the spokes or the hubs of the wheels. The driving arrangement also has the effect of relieving much of the strain which was formerly imposed upon the driving shaft of the machine, as the face plates are rigidly connected through the work.

The principal dimensions of the lathe are as follows: Distance between face plates, 6 feet 8 inches to 9 feet; swing over bed, 92 inches; diameter of face plates, 90 inches; diameters of work admitted, 60 to 84 inches; length of bed, 22 feet 8 inches; greatest width of bed, 100 inches.

The bed is of very rigid box pattern, with double web box girths; the tool rests are of heavy pattern, newly designed, and have swiveling bases. The feed mechanism is conveniently controlled from the operator's position in front of the work. It comprises a horizontal rock shaft at the front of the bed, driven from the head of the machine, which makes six vibrations to one revolution of the work, in this way dividing the feed of the tool into the work and making it more nearly continuous. The rock shaft is easily connected or disconnected from the ratchet wrenches on the cross traverse screws on the tool carriages.

The face plates are driven by internal gears and are provided with openings to admit the crank pins of the driving wheels, so that the latter may always be chucked close to the face plates. In placing wheels in the machine or taking them out it is not necessary to change the position of the carriages. All that is required is the moving of the tail stock sufficiently to the rear to withdraw the crank pins from the openings in the face plates. To provide for the quick removing of the wheels an independent 5 horse-power motor is furnished for traversing the tail stock. It takes only from 10 to 15 minutes to chuck a pair of wheels in the lathe ready for turning.

The main drive is from a 40 horse-power Westinghouse motor having a speed variation of one to two, which, in combination with the gear changes, gives cutting speeds of a minimum on a diameter of 84 inches of 10 feet per minute and a maximum on a diameter of 48 inches of 25 feet per minute.



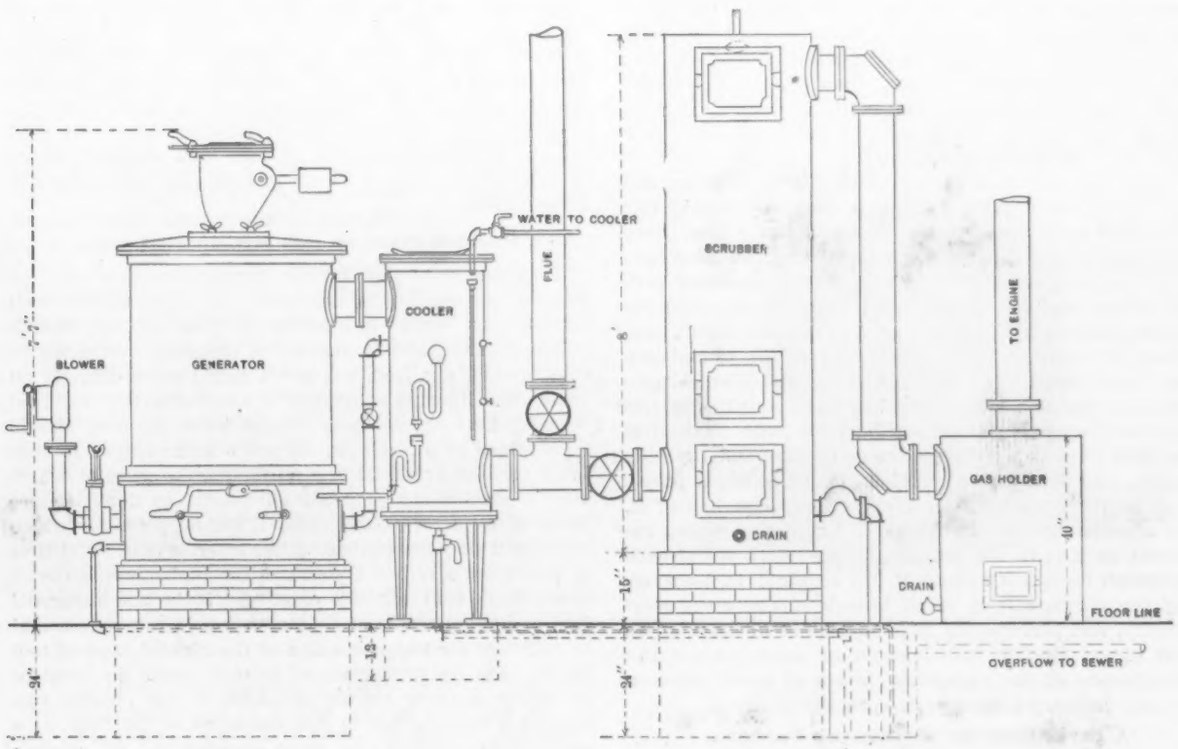
Niles 90-Inch Driving Wheel Chucking Lathe Driven by a 40 Horse-Power Westinghouse Motor.

The Scranton Bolt & Nut Company.—The Scranton Bolt & Nut Company, Scranton, Pa., which purchased the rolling mill and spike factory of the Timmes & Hecht Company, located in Keyset Valley, at West Scranton, last April, has been operating the works since the absorption of the property. It expects to dismantle the mills during the month of September and reconstruct them on a site adjacent to the bolt works and have them running in October. Foundations for the new buildings are prepared. They will be of steel construction. One will be 122 x 200 feet and the other 50 x 150 feet. These mills when completed will consist of an 18-inch bar mill and a 10-inch combination mill, all new and containing the latest improvements. The engines will be of the Allis type and the boilers the Hyde vertical tubular. In these new mills special attention will be given to the manufacture of refined bar iron and also to the making of track, mine and dock spikes. By the addition of these two mills the output of the present plant will be doubled, the capacity being increased to about 40,000 tons per year, giving employment to about 600 hands. Many new features will be introduced for the handling of both raw material and the finished product. A substantial increase is also being made in the puddle mill capacity and output.

The Backus Suction Gas Producer.

Among the new gas producers brought out lately as a consequence of the growing interest in gas power is one built by the Backus Water Motor Company, Newark, N. J. The accompanying engraving shows the arrangement of a plant having a capacity of 75 horse-power. The general principle of the operation of the plant is identical with that now familiar to the public, but there are certain new features in the details of design on which special claims are based.

Suction gas producers depend upon the inhaling action of the engine to generate the gas in only such quantity as is demanded and the gas generation ceases when the engine is stopped. During its operation air laden with steam is drawn through the generator, and the combination of the two in contact with the heated fuel in the producer liberates gas. This gas passes from the generator through a cooler, then through a scrubber, and finally into a gas holder from which the engine draws its supply.



Elevation Showing the Parts and Arrangement of a Backus Suction Gas Producer Equipment.

The generator is a cylindrical stove, lined with fire brick, into the top of which the fuel is introduced through a bell and hopper. The latter admits the fuel without letting in air and distributes the fuel evenly, making it easy to maintain a level fire and avoid the formation of holes or pockets. Anthracite pea coal is the most suitable fuel and may be had at fairly moderate cost. Almost any kind of coal will do, however, except soft coal high in oils and volatile matter.

In passing through the cooler the gas gives up heat to the water, forming steam, which is partly taken up by the gas, enriching it by the addition of hydrogen that is freed when the vapor is decomposed, and its oxygen combines with the carbon of the coal to form carbon monoxide (CO). The excess of steam in the cooler is piped to the bottom of the producer to facilitate combustion. The cooler catches the hydrocarbon impurities in the gas, including tar, and these are removed as the gas passes through the scrubber. The gas is piped from the bottom of the cooler to the bottom of the scrubber, where it is purified and put into condition to be used by the engine. A water bath contained in the bottom of the scrubber catches any heavy particles of ash which may be carried over. The level of the water in this bath may be adjusted by turning the swiveling goose neck on the overflow, and will thereafter be automatically maintained at a uniform hight. Above the water bath is a bed of coke upon which a spray of water is constantly thrown.

The gas holder is in effect a reservoir and aids in making the draft through the apparatus constant instead of pulsating, as it would be if the intermittent suction of the engine communicated directly. A comparatively small gas holder is sufficient, as the scrubber acts in some measure as a reservoir.

On shutting down the plant the generator is cut off from the scrubber and opened to the atmosphere through the flue shown. Natural draft keeps the fire burning moderately until it is time to start up again. Over night the fire is maintained, and ten minutes' blowing in the morning is enough to put the producer in operation. While the producer is idle air is excluded to prevent its mixing with the gas and forming an explosive mixture. The low pressure on the apparatus, characteristic of the suction type of producer, is conducive to the greatest safety. There is very little, if any, possibility of explosions, and such precautions as are necessary are provided in the way of valves and safety devices.

It is interesting to know that the regulations of the Board of Fire Underwriters with regard to the use of producer gas are inclined to favor suction producers. These require that pressure systems must be located in independent buildings, while suction producers up to 250 horse-power may be placed in a separate inclosed, well ventilated room in any building where the natural light is good. While the plant is not in operation the connection between the generator and scrubber must be closed and the connection between the scrubber and vent pipe open, so that the products of combustion can be carried into the open air. The opening for admitting fuel must be provided with some charging device so that no considerable quantity of air can be admitted while charging.

At the time of its convention at Atlantic City in the last week in June the American Society for Testing Materials had 677 members. Since then 45 applications for membership have been approved and there have been two losses, so that the present membership is 720. The Executive Committee is entering on a campaign for a membership of 1000 before the next annual convention.

The Electric Furnace in Steel Making.

In a recent issue of the Engineering Supplement of the London *Times*, F. W. Harbord writes of the place the electric furnace may be expected to take in the British steel industry. Already one electric furnace has been operated at a Sheffield steel works, and it is reported that another Sheffield company has acquired the exclusive patent rights of the Héroult process for Great Britain. We quote from the article as follows:

While on the one hand the extravagant claims urged on behalf of electric smelting—that it will revolutionize the manufacture of structural steels as at present made by the Bessemer and open hearth process—may be dismissed as nonsense, the attempts on the other hand to prove that it cannot compete with the crucible process in the manufacture of tool steels or the open hearth furnace for many of the higher class steels intermediate between these and common structural steel may equally be disregarded. The truth lies between these two extremes, and the manufacturer who realizes this and takes advantage of the great possibilities which the electric furnace offers to meet very many of the special steel requirements of to-day and who does so with judgment and knowledge will, without doubt, be in a most exceptional position, not only to meet foreign competition, but to more than hold his own against his British competitors.

Since the Canadian Commission visited Europe last year, rather more than a year has elapsed. During this time very considerable quantities of electric steel have been made both in Sweden and in France and have been used with most satisfactory results for all classes of tools and cutlery and for various other purposes for which the highest class crucible steel was formerly employed, confirming in every way the conclusions of the commission that "steel equal in all respects to the best Sheffield crucible steel can be made." Considerable quantities of this steel have been supplied to Sheffield firms who have thus been able to convince themselves of its exceptionally high quality, and it now only remains for our Sheffield people to make the steel for themselves rather than import it. The manufacture of crucible steel for tool purposes, important as it is to the country, owing to the world-wide reputation for quality which it has acquired, is, however, only one comparatively small branch of our great steel industry, and perhaps the most important question is to what extent electric smelting can be employed for the manufacture of the numerous classes of steels between this and ordinary Bessemer or open hearth steel.

A Large Field for the Electric Furnace.

We import annually very large quantities of Swedish Bessemer steel for tube blanks for the solid drawn tube trade, and for other purposes too numerous to mention; again, large quantities of Swedish pig irons are imported for use in our open hearth furnaces for the manufacture of special qualities of high class steel for large forgings, axles, tires, special wire and other purposes, and in many cases steel of the required composition can only be made by using, either entirely or in part, these very high priced pig irons. Another very important branch of the steel trade is the production of dynamo steel of exceptional purity and low hysteresis, and in this direction the electric furnace promises great things, as steel of the greatest purity, low in carbon and manganese, can readily be produced. If we add to these the manufacture of all kinds of ordnance, armor plate, projectiles, rifle, bayonet and other high class steel, we see that without attempting to compete with Bessemer or ordinary open hearth structural steel there is an immense field open to the electric furnace. Numerous experiments have shown that electric steel is not only extremely pure, but it is also exceptionally homogeneous, and this is a most important point in the manufacture of large steel castings. When it is remembered that for special purposes castings, sometimes of 50 to 60 tons, have to be made by mixing the contents of a number of crucibles not containing more than 1 hundredweight each, the advantages of being able to make steel equal in all respects as to quality, in quantities of 15 tons and possibly more, will readily be apparent.

If steel to satisfy the exacting requirements of the highest class of tool steel can be produced, there can be no question as to the production of steel of a quality suitable for what we may term medium class steels, and it then becomes simply a question of cost, and whether the electric furnace can compete in this respect with Swedish Bessemer steel, or steel made from Swedish pig iron or steel of specially selected English brands.

In the electric furnace of the resistance type, which may be said to be represented by the Héroult and Keller furnaces, the highest class steel can be made from ordinary English scrap, such as rail ends, but against the saving effected in this direction has to be set the cost of the electric energy required. The electric furnace, even under the best conditions, is not a cheap melter, but as a refining furnace toward the end of the operation, when a very high temperature is required, it is far more efficient; it therefore seems probable that the future development of the electric furnace will be in combination with some form of continuous open hearth process in which molten pig iron is first converted into what we may term "molten scrap steel" in a gas-fired furnace and then transferred in the molten state to the electric furnace for final purification. By this means the additional cost over ordinary open hearth steel would be comparatively small, the melting and preliminary refining having been done in the gas-fired furnace, and the electric furnace being employed only to do the final refining at such high temperatures as those at which it alone is able to work most efficiently and economically.

Héroult, Stassano and Kjellin Furnaces.

The design of the Héroult furnace, so far as the general construction is concerned, is particularly well adapted to work in combination with an open hearth tilting furnace, and if, instead of charging cold scrap or even molten pig iron, converted metal were charged on some such lines as suggested, a steel superior to best Swedish steel, or steel made from Swedish pig iron, should be obtained at a less cost. Given a large output so that labor costs are reduced to a minimum, the price at which such a steel could be produced would no doubt induce many manufacturers to employ it for purposes for which at present they are content to use inferior steel; and thus it would soon create a demand for high class material apart from that already existing. It is not suggested that a simple refining of ordinary steel in this way would be sufficient for the production of the highest class of tool steels. For the production of these it would no doubt be necessary to carry on the operation in the electric furnace in a way similar to that employed at La Praz, at a considerably greater cost as to expenditure of electric energy, time and labor; but in these cases the process is not competing with the open hearth method but with the crucible process, in which, although the output may be comparatively small, there is a much greater margin as regards cost of production, and the question of a pound or so a ton is of no great consequence.

There are two other types, the induction furnace and the arc furnace, which are now competing with the resistance furnace for the favor of the English steel maker. The former is represented by the Kjellin furnace, which has been at work for several years in Sweden, and the latter by the Stassano furnace, which has been at work for a considerable time in Italy. The Kjellin furnace is quite distinct both in principle and construction from the Héroult furnace, while the difference between the principle of the latter and arc furnaces generally is not so clearly marked, and they merge one into the other. In general arrangement, and also as regards electrical and other details, the Stassano furnace is totally distinct from the Héroult, and it was primarily designed for the direct smelting of iron ore rather than for steel making, although it has been producing steel most satisfactorily for some time. From a practical engineering and metallurgical standpoint, however, there can be no doubt that the Héroult furnace is far better designed to meet the general requirements of the steel manufacturer than either the Stassano or the Kjellin furnace.

It is understood that a furnace of the latter type is already at work in Sheffield, and there can be no question as to the quality of the steel produced, provided high class

material, such as Walloon scrap, is used for its production. In Sweden, where a furnace is attached to works producing this high class scrap, probably this furnace is as good and may under such conditions be even better than the Héroult: but the objection to it under English conditions is its lack of adaptability both as regards the materials which can be used and any variation in design to suit the conditions of our practice. In reality it is a large melting crucible, and to get the highest class of steel it is necessary, just as in the crucible process, to charge the purest materials, as the amount of purification which takes place during the operation is practically very small. On the other hand the Héroult process can deal with ordinary English scrap or pig iron, and by the repeated addition of suitable fluxes to form new slags the impurities can be removed so that a final product is obtained equal if not superior to much that is made from Swedish materials in a crucible.

Superior Properties of Electric Steel.

That steel made in an electric furnace should possess superior properties to steel of similar composition produced either in a Swedish Bessemer converter or in an open hearth steel furnace may seem at first to be claiming a great deal, but such appears to be undoubtedly the fact, and this is due probably to its production in what may be regarded as a practically neutral atmosphere, under conditions in which the occlusion of gases and overoxidation are reduced to a minimum.

It is frequently urged that the cost of electric energy in this country makes the production of steel in anything like quantities a commercial impossibility; but with electric energy at £10 per kilowatt year, at which price it can be produced under favorable conditions from coal, and by using the gas furnace for the melting and the electric furnace only for the final operation, the difference in cost as regards electric energy will probably be more than met by the lower price of our raw material and our proximity to markets for the sale of the finished product. When the irregularity in supply due to the change of seasons and the generally inaccessible position and remoteness from sources of supply and from markets for the sale of the finished product are taken into consideration, the much talked of cheap production of electric energy from water power will often be found to be more apparent than real.

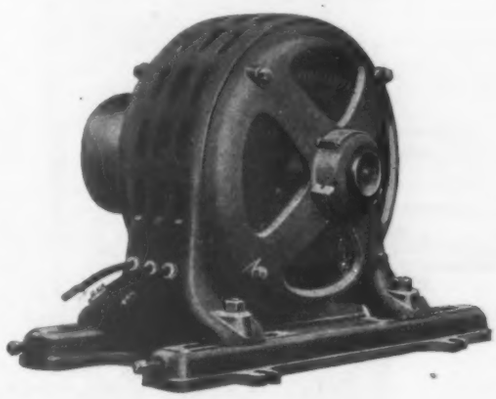
Drying by Fan Blowers.—The necessity of ample air and good circulation in drying is emphasized by the following statement made at a recent meeting of the American Society of Heating and Ventilating Engineers: "The philosophy of drying or evaporating moisture by heating air rests upon the fact that the capacity of air for moisture is rapidly increased by rise in temperature. If air at 52 degrees is heated to 72 degrees its capacity for moisture is doubled and is four times what is was at 32 degrees. For each 15 pounds of water required to be evaporated per hour in a drying room 1 horse-power of boiler, 130 square feet of steam pipe and 14,000 cubic feet of air are required under good conditions." Although 20 years ago Baldwin, in his book "Steam Heating for Buildings," stated that "it is not profitable to dry by forcing air, as with a fan or blower, in connection with steam coils," it is true that since then drying by fan blowers has practically superseded all other methods.

The *Financial Chronicle* refers to one source of the recent advance in stock market values—namely, the increase in the country's bank note circulation in the last five or six years. The volume of outstanding circulation, based on bonds, has more than doubled, the addition reaching over $255,000,000. In this same period the gold holdings of the Government have increased fully as much as the national bank notes, and of the $2,901,791,907 composing the general stock of money in the country, coined or issued, on August 1, $1,368,427,343, or not far from half of the total amount, is in gold coin or gold certificates. Whatever inflation there has been going on thus far has therefore been a gold inflation rather than a paper one.

The New Commercial Electric Induction Motor.

Since the expiration of the basic patents on induction motors, which prevented competition in this country, a number of new motors of this type have been brought out by companies which heretofore confined themselves to direct current machinery Among the latter is the Commercial Electric Company, Indianapolis, Ind., which has recently developed a constant speed induction motor, illustrated herewith. The company's previous experience in the manufacture of direct current motors has been of use in the mechanical designing of this new machine, and its electrical features are claimed to be not of an experimental nature, inasmuch as advantage has been taken of the knowledge gained in European countries, where there has been the keenest competition.

The motor is made in two classes, M. T. and H. T., for constant speed work, the selection of the class depending upon the nature of the work to be performed. Among the points of special advantage on which emphasis is laid are the high power factor, large nominal break down factor, high efficiency at both heavy and light loads, low working temperatures, small idle currents and high starting torques. To obtain a high power factor it is necessary that the clearance between the rotor and stator be limited and uniform. To this end



New Constant Speed Induction Motor, Made by the Commercial Electric Company.

the stator frame and stator bead have been designed to give an equal division to this clearance, which is always maintained. It is stated to be impossible to assemble the machine so that the air gap on opposite sides of the rotor will be unequal. To reduce the wear of the rotor shaft very large bearing surfaces have been provided. The bearings are self oiling and self aligning, and are reversible to allow the machines to be inverted when it is desirable to suspend them from ceilings. Their arrangement is such that carelessly flooding them with oil can cause no damage to the machine. When required the bearings are made dust proof. The bearing linings are duplicate and interchangeable, so that the replacing of the bearing is simpler and less expensive than accurately adjusting the ordinary adjustable bearings.

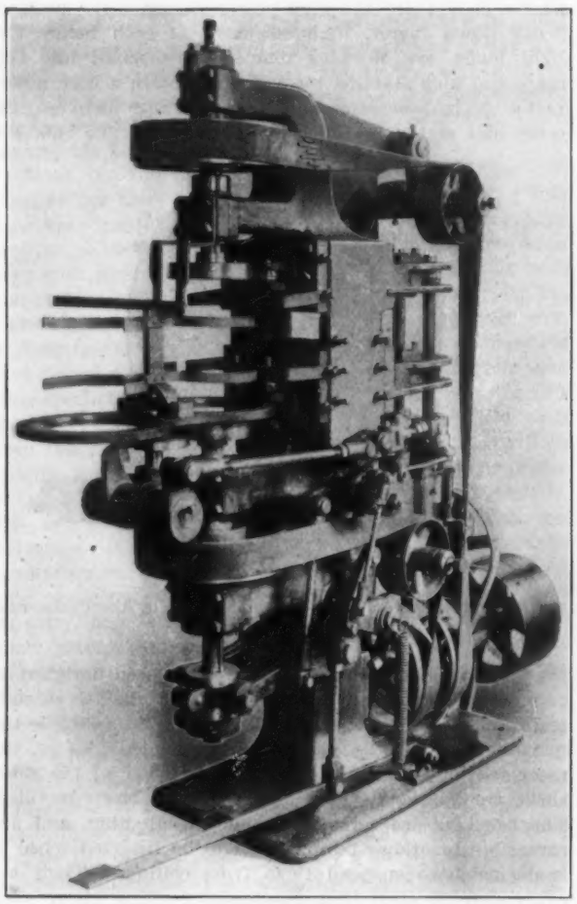
The shaft is of crucible steel, of large diameter and as short between bearings as it is possible to make it, consequently it is rigid and not easily sprung. The shaft is ground and the bearings are carefully polished. The rotor is forced on the shaft with hydraulic pressure. Ventilating apertures, as may be seen from the cut, are provided across the faces of the stator and rotor, so that the freest circulation of air is secured, insuring cool operation. Special attention has been given to the starting device, as a result of which the starting current is stated to be reduced practically to that used in a direct current motor of an equivalent capacity.

The types of motors referred to are manufactured in all standard capacities from 5 to 200 horse-power. For smaller sizes the company builds a line of single phase, self starting induction motors made in capacities of 1 to 5 horse-power. The machines are made for all standard voltages and frequences in both two and three phase forms for 25 or 60 cycles per second.

The Niagara Automatic Can Seamer.

There are two distinct parts in the process of manufacturing cylindrical vessels such as powder kegs, oil cans, &c.—namely, the forming of the cylindrical body and the attaching of the two ends. A description of an automatic machine for making cans, built by the Niagara Machine & Tool Works, Buffalo, N. Y., was contained in *The Iron Age* February 18, 1904, and the accompanying illustration shows a new machine made by the same concern for simultaneously seaming both ends of the cans. This machine is also automatic, as the time during which the seaming rolls remain in action and the pressure exerted by them are in no way dependent on the operator. A great saving of labor and time is effected with the machine and a clean and uniform product is obtained.

From the accompanying engraving the principles of the operation of the machine may be easily understood.



Automatic Can Seamer, Built by the Niagara Machine & Tool Works, Buffalo, N. Y.

By depressing the foot treadle the lower chuck, which carries the work, is raised and the seamer rolls are caused to act upon both seams for the required length of time. After completing the seams the cam shafts stop until the treadle is again depressed. As the machine has a double feed table, while one vessel is being seamed the operator may be placing the heads and body of another can in position.

The shafts that carry the upper and lower chucks are actuated from the same driving shaft, giving uniform speed. The vertical shafts in the rear of the machine carry the mechanism for operating the seamer rolls. A clutch, which is engaged by depressing the foot treadle, controls the motion of these shafts. The lower seamer rolls are carried on a head in the frame of the machine, which is vertically adjustable to accommodate work of different hights. The shell of this head can be set forward toward the chuck shaft when work of comparatively small diameter is being seamed. The driving pulley for the lower chuck shaft is mounted on a sleeve revolving in the two lower bearings of the frame. The lower chuck shaft fits into this sleeve, thereby relieving it from any strain caused by the belt. To tighten the belts when needed those driving the chuck shafts run over idlers attached to levers.

The machine shown in the illustration is intended for work from 6 to 13 inches in diameter and from 7 to 16 inches high. The manufacturer is in a position to furnish similar seamers for other ranges of work.

Mexican Trade Notes.

The Rains and Crop Prospects.

DURANGO, August 16, 1905.—In a country like Mexico, which has virtually only two seasons, the wet and dry, and whose prosperity depends in so great a degree upon the rains coming at the right time and continuing in sufficient quantity for the needs of agriculture, the months of June, July and August are crucial ones. If the rains are delayed or are scanty when they do come the prospects for bounteous crops of various staples are doubtful, while early rains, well distributed and continuous through those months, furnish a basis upon which hopeful anticipations may be reared in regard to prospective harvests. All the indications this year are favorable. Already predicitons are being made of a "record breaking" cotton crop. One of the principal planters of the Laguna district, Mexico's principal source of production, estimates the coming yield at 100,000 bales.

Faults of Exporters.

The leading English daily newspaper published in the City of Mexico re-echoes the old and oft repeated complaints against United States manufacturers in relation to the many defects in their system of cultivating Latin-American trade. Says the journal alluded to:

American machinery is admitted to be excellent, but it is not suited to the rough handling of the unskilled Indians. By most of these a machine is made to perform its duty regardless of the defects which may exist through faulty installation or other causes. The laborers do not stop to take these possibilities into consideration. They cannot appreciate the fine working parts and complicated machinery nor the careful handling it demands. European machinery is fully one-fourth to one-half heavier than American machinery of the same power and will stand much rough treatment.

Another source of complaint is that carelessness is displayed by American manufacturers in shipping machinery and accessories, which frequently arrive in very bad condition, requiring the missing parts to be replaced by native mechanics, who thereby jeopardize the working of the machines. The European manufacturer assumes no risk through irresponsible packers or assistants; his products are packed and shipped in a faultless manner, which satisfies his customers, who are quick to appreciate all that this means to them, especially if they are located in some remote section where it is difficult to transport machinery and almost impossible to replace parts that are missing or broken.

By thoroughly canvassing this country American manufacturers will no doubt easily overcome these objections and greatly increase the demand for their machinery of all kinds, which is, notwithstanding criticisms, already held in high esteem. There would be a large field for small motors, pumps, rams, &c., which could be applied to a variety of purposes, such as sawing wood, filling water tanks for stock and running coffee fanners, corn shellers, decorticating machines and small cane mills.

Consular reports, correspondents of trade journals and globe trotting travelers have reiterated these complaints against the manufacturer of the United States for half a century. It seems impossible to believe that the American shipper has failed through all these years to profit by this wearisome repetition of his shortcomings. As a matter of fact, trade statistics, and particularly Mexican trade statistics, go to show that he has very much improved both in his manner of obtaining orders for his varied wares and in his way of filling them, or how else shall we explain the expansion of his trade with his foreign customers? To assert at this late day that the manufacturers of the United States who cater to a foreign trade pack their goods badly, that they ship machinery without the parts necessary for its proper operation or that they are brusque and unaccommodating in the matter of credit is equivalent to saying that they are thick witted, that they do not read the trade papers or consular reports, that they are in effect indifferent to their own welfare—hardly a reasonable supposition.

It is rather to be believed that the real explanation

of these plaints, which appear from time to time, is to be found in the fact that certain writers, hypnotized by the antiquity of the charges, and assuming them to be well founded, without investigation, find it convenient to work them into any thesis which they may be moved to contribute to the always interesting discussion of the United States trade relations with Latin-America.

Railroad Concessions and Construction.

The San Carlos Copper Company has obtained a concession for the extension of the line of railroad which it is constructing between San José and Linares to Soto la Marina, Tamaulipas. This extension will afford transportation facilities to the colonists of the proposed Mexican branch of Mr. Dowie's Zion.

The concession granted in 1902 for a railroad to connect the States of Vera Cruz and Oaxaca, the road to run from a point upon the Vera Cruz and Pacific Railroad in the first-named State to the Refugio Hacienda in Oaxaca, has been amended a second time by the extension of one year from the present date for the completion of the road.

Señor Romero, owner of the Tamara y Anexas and other mines in the Hostotipaquilla district, in the State of Jalisco, intends to construct a railroad from the mines to Etzatlan, the distance being about 100 miles.

Additional time has been granted to the concessionaire of the proposed electric railway between the City of Mexico and Puebla. The concession is held by Benjamin Barios of the City of Mexico on behalf of the Mexico & Puebla Railway Company.

Alfonso B. Smith, to whom a concession was granted in 1898 to construct a railroad from a point on the Rio Colorado to St. George's Bay, in the State of Sonora, having failed to fulfill his contract with the Government, the franchise has been revoked and the deposit of $5000 in bonds made by the concessionaire confiscated.

The Government has increased by the sum of $555,000 the subsidy to be paid to the Kansas City, Mexico & Orient Railway Company, and has also given the company an addition of five years' time for the completion of the projected line in Mexico. The total subsidy is now $5,305,000, the increase of $555,000 being for the "mountain division" of 150 km.

The Mexican Central Railway Company has purchased the Coahuila & Pacific Railway, the price paid being $2,660,000. The same company holds an option on the railroad of the Mexican National Construction Company, which extends from Manzanillo to Colima.

Industrial Notes.

At a recent meeting of the stockholders of the Mexican Aluminum Mfg. Company of the City of Mexico officers and a Board of Directors, consisting of the following persons, were elected: A. L. Van Antwerpt, president; W. E. Herrmann, vice-president; H. C. Head, treasurer; J. Madrid Terres, secretary; W. J. De Gress, Manuel Septien y Cosio and Aquiles Elorduy, directors.

The New York syndicate which owns the large deposit of iron ore situated near Chilpancingo, in the State of Guerro, is making arrangements to push actively the development of the property. It is reported that a line of electrically operated railroad will be constructed from the property to the port of Acapulco, 35 miles distant, and the ore shipped to the United States.

Señor Rafael Pardo, an attorney representing L. C. Browne, has made an application to the Government for a concession to establish a bicycle and automobile manufactory in the capital.

A project is on foot with which the name of W. H. Ellis of Abyssinian fame is connected to establish a steel manufacturing plant at Monclova, in the State of Coahuila. Coal and iron ore lands which Mr. Ellis is said to control are situated in the neighborhood of the proposed site of the works. These, it is said, will be taken over by a company capitalized at $500,000, gold, which is to be incorporated under the laws of New Jersey, and that as soon as the necessary preliminaries have been arranged work upon the erection of the plant will begin.

A new importing firm, whose members are C. H. Harrison and W. C. Bruce, has been established in the City of Mexico under the name of La Casa Importadora. Among other specialties the firm will handle imported safes.

A contract for a turbine and the necessary equipment for an electric light plant for the town of Allende, Coahuila, has been let by the local company having the work in hand to the Platt Iron Works, Dayton, Ohio.

Machinery has been ordered from the United States for the development of new coal lands recently discovered at El Valle de los Puentes, in the State of Jalisco.

The Mexican Car & Foundry Company, Mexico City, has completed the installation of its machinery and is now ready to begin operations in the manufacture and repair of rolling stock.

A new system of electric street railways is in course of construction in the City of Guadalajara by a company bearing the name La Electra (Sociedad Anonima), which intends to erect a new power plant at the falls of the Santiago River at a cost of $500,000.

Arthur H. Woolrich has made an application for a concession to utilize 7000 liters of water per second from the River Atoyac, in the State of Oaxaca, for the generation of electrical power.

What is said to be the largest contract ever made by the Government for products of native origin—certainly the largest for iron and steel manufactured products—has, according to the local press, recently been awarded to the Monterey Iron & Steel Company, which was the successful bidder over a number of foreign manufacturers for the structural and other iron and steel material and apparatus which are to be used in the work of improving and equipping upon modern lines the seaport of San Benito. The contract involves the expenditure of $450,000, Mexican, by the Government. The work includes the construction of a steel wharf 635 meters long and 25 meters wide, the laying of trackage, the erection of warehouses and hoisting cranes and the supplying of other appliances necessary in the equipment of modern port works. J. J. D.

The Acme Harvester Company Reorganized.—The Acme Harvester Company, Peoria, Ill., which went into the hands of a receiver about 18 months ago, has been reorganized as the Acme Harvesting Machine Company, being incorporated under the laws of New Jersey for $2,000,000. The directors of the company are David R. Forgan, president of the First National Bank, Chicago, president; A. G. Becker, financier and promoter, Chicago; S. D. Porter, Peoria, treasurer and general manager; Robert Schaffner, Peoria, secretary; Ferdinand Luthy, Peoria, implement jobber; G. H. Burr and F. W. Garvin. W. H. Lee, vice-president, and J. A. Scanland, assistant treasurer, are officers, but not directors. Mr. Porter has been in charge of the property on behalf of the receiver since the failure and has operated it with such skill as to warrant the reorganization on the lines named. The directors have issued a statement, which is in part as follows: "The new company is equipped with ample capital and is preparing to carry on a vigorous campaign for the ensuing season. The policy of making sale contracts only, which has proved so popular with the implement dealers during the past season, will be continued. Owing to the big demand for Acme machines the company finds it necessary to largely increase the facilities for manufacturing, and arrangements have been made for the erection of new warehouses and other equipment." The company makes twine binders, reapers, mowers, hay rakes, headers and a general line of harvesting machines.

In order to regulate the supply of mixture to a gas engine so as to enable the relative proportions of gas and air to be varied according to the varying calorific value of the combustible gas an arrangement has been devised by which a flame of the gas is caused to heat a metal rod, more or less according to the intensity of the flame, the expansion of the rod effecting the regulation of the gas and air butterfly valves by means of a lazytongs and multiplying lever arrangement. There is an alternative method by which the flame is made to affect the electrical resistance of a wire, the change of resistance accomplishing the same purpose by electrical means.

The Restriction of Output.

WASHINGTON D. C., August 22, 1905.—The Bureau of Labor of the Department of Commerce and Labor has compiled a very elaborate report on the regulation and restriction of output in certain industries including the manufacture of iron and steel. The work of gathering data for this report was begun a little more than a year ago, the purpose being to supply information with regard to a question that has been the subject of much discussion during the past decade but with regard to which no comprehensive official report has ever been made, either in this or in other countries. The report is not limited to the restrictions imposed by labor unions, but embraces an outline of the operations of the various organizations, pools and agreements of manufacturers formed for the purpose of regulating production. Through the courtesy of Dr. Niell, Commissioner of Labor, the correspondent of *The Iron Age* is enabled to present an advance abstract of the features of this report dealing with the iron and steel industry. It should be borne in mind that some of the data here embraced were gathered several months ago and that minor changes have since taken place.

In the iron and steel industry information has been collected with reference to several associations or pools of manufacturers which regulate or restrict the output of particular lines of products. The information is so limited, however, that it seems hardly necessary to repeat it here. The restrictions imposed by unions are given at some length and in this respect the report is extremely interesting.

Restrictions Imposed by Unions.

The United Sons of Vulcan, consisting of boilers and puddlers, was organized in 1858. The Association Brotherhood of Iron and Steel Heaters, Rollers and Roughers was organized in 1872. The Iron and Steel Roll Hands' Union, composed of catchers, hookers, helpers and others engaged about the trains of rolls was organized in 1873. These three organizations were consolidated in the Amalgamated Association of Iron, Steel and Tin Workers of the United States in 1876. In 1881 it was voted to include Canada within its jurisdiction and to make colored men eligible to membership. The Amalgamated Association thus includes skilled workmen and their helpers in the puddling, sheet and tin plate mills. These skilled operatives include about 10 per cent. of all workmen in the iron and steel industry from the ore to the finished product. Even in such mills as are controlled by the Amalgamated Association restrictions occur only at certain points—namely, on the entire labor in puddling, one-half of the labor in making sheet steel and one-third of the labor in making tin plate.

Basis of Wage Scale.

The annual convention of the Amalgamated Association adopts a scale of wages, which is a sliding scale, based upon the selling price of the finished products, but in each case there is a minimum rate. The boiling or puddling scale specifies the wages to be paid per ton according to the selling price of the bar iron. The sheet mill scale specifies that wages shall be paid according to the average selling price of sheet steel of Nos. 26, 27 and 28 gauges. The scale for tin plate mills fixes the wages to be paid according to the selling price of a box of 100 pounds of coke tin plates.

East of the Alleghanies the Amalgamated Association is not strong enough to prescribe a scale, there being a number of puddling mills, but only a few sheet mills and no tin plate mills. The Eastern rate for puddling is usually from $1.25 to $1.50 per ton lower than the Western rate. When, for instance, the Amalgamated scale for puddling is $5.25 per ton the Eastern price is from $3.75 to $4. This difference was originally made as a differential to equalize competitive conditions between the East and the West on the basis of higher cost of coal in the East.

Since the men work in teams, and some of them are hired by the head man or leader of each team, it will be understood that the matter of apprenticeship regulates itself. In fact, there are no apprentices nor apprenticeship rules. There must be a certain number of men in each team, and they are promoted gradually as vacancies occur, usually in regular order, but there is no clearly defined rule as to this matter. A man is supposed to be advanced from the lower and poorer paid jobs to the higher positions not by the time he has been employed but by his aptitude and development in skill. Favoritism, however, is common.

The prevalence of the team system on a piece rate or tonnage basis explains in part the attitude of the union in limiting the amount of work in these particular occupations. The entire team must work together, and any member of the team who is physically inferior is subject to strain and overexertion. This accounts in part for the very severe penalties placed on the member guilty of exceeding the limits of output. There is, of course, also the fear of a cut in the piece rates. Besides the special rules applying to the particular mills a general rule provides "that any mill known to be continually violating the limit of output be considered 'black' and its charter immediately revoked."

Puddling Mills.

The words "puddling" and "boiling" are used interchangeably, the former being the more common in the East, the latter in the West. Some puddling mills are operated under the single-turn system, some under the double-turn system, and some under the three-turn system. The Amalgamated scale contains the following restrictions on output:

> The charge for boiling furnaces shall be as follows: Single furnaces, not more than 550 pounds per heat; double furnaces, not more than 1100 pounds per heat; Siemens furnaces, not more than 1550 pounds per heat; double double furnaces, not more than 2200 pounds per heat; and it is understood that two weeks' work shall be averaged.

The scale also provides that five heats shall constitute a day's work in a double-turn mill or a three-turn mill, but allows six heats in a single-turn mill. The large mills usually run three turns, so as to get the greatest possible production in 24 hours, and on three-turn it is a physical impossibility to make over five heats per turn; usually only four can be made. Most manufacturers agree that 550 pounds of pig iron is an economical charge; that it is as much as two men (a puddler and a helper) can handle to advantage and bring out the product with success. It has also been found to be an economical charge as regards waste. In case the charge is larger the iron must remain in the furnace longer, and the longer it is in the furnace the greater the percentage of waste.

In puddling mills where the restriction of the Amalgamated Association applies the production of each puddling furnace is as follows: 550 pounds a charge × 5 heats × 11 turns = 30,250 pounds per week. In such mills the puddlers always puddle that amount per week, barring accidents or other sufficient cause. There are no complaints that the limit of output is not reached, but in three-turn mills five heats may be impossible in puddling some kinds of iron. In summer the puddlers may make only three or four heats in a turn—sometimes only two—on account of the hot weather. As earnings are on a tonnage basis the earnings of puddlers are in proportion to their production.

Production in Nonunion Mills.

In some nonunion mills the production of the puddlers is no more than the Amalgamated scale allows, but in other nonunion mills the production is greater. In one mill in Pittsburgh which produces a common grade of iron the charge is 600 pounds. The men work two turns a day, 11 turns a week. Therefore their production is as follows: 600 pounds a charge × 5 heats × 11 turns = 33,000 pounds a week. This is 2750 pounds more than the Amalgamated scale allows. In few nonunion mills is the production more than this; in most of them it is not as much; in none is the charge over 600 pounds. In nearly all cases the mills which have an unusually large production produce the cheaper and coarser grades of iron.

In a union mill in Pittsburgh which makes a fine grade of iron the charge is only 500 pounds, though the Amalgamated scale allows 550 pounds. The production in this mill is therefore as follows: 500 pounds a charge × 5 heats × 11 turns = 27,500 pounds a week, or 2750 pounds less than is allowed under the Amalgamated scale. The

superintendent of this mill holds that the best results are not obtained with a charge greater than 500 pounds; that if the charge is larger there is not sufficient room in the furnace to work the metal to a uniform grade. An official in another company who was interviewed said: "It stands to reason if the charge is too large the puddler cannot make good, clean iron, as there is not room enough in the furnace to work it."

It should be noticed that the Amalgamated Association does not limit each charge to 550 pounds, but that "two weeks'" work shall be averaged. The Amalgamated scale has the following restriction on the time of a heat:

> In order to insure uniformity of iron in boiling furnaces and avoid the increasing custom of running in strong for common iron, thus increasing the hours and work of the boiler, the limit of time for each heat shall be as follows: For a single furnace, one hour and forty-five minutes; for a double furnace, one hour and fifty minutes; for Siemens furnace, one hour and fifty-five minutes, and for a double double furnace, two hours.

This rule is not very rigidly observed. The heats may require from an hour to two hours and a half each, according to the quality of the iron and the quality of the coal. The position of the Amalgamated Association is that the puddler should receive extra pay when extra hard iron or unusually poor coal is used, making the average time of a heat in a single furnace longer than an hour and forty-five minutes. The scale provides that $1 per ton extra shall be paid for puddling dephosphorized iron or iron containing 60 per cent. or more of Bessemer.

Sheet Mills.

Sheet steel is made from steel bars of about 8 inches wide and varying thickness, the usual thickness being about ½ inch. The length of the bars varies from 22 to 56 inches, according to the width of the sheet to be produced. To prepare the bars for rolling they are heated in what are called pair furnaces, so called because the bars are heated in pairs. Fifteen pairs, or 30 bars, constitute a heat, but often in practice only nine pairs, or 18 bars, are heated at once.

In union mills until January 1, 1904, the limit of output per turn under the three-turn system was 135 pairs. Manufacturers claimed that the restriction was very unjust, especially as it applied to sheets of all sizes and to sheets of all gauges or weights. In mills working sheets 30 or more inches wide and 104 inches long 135 pairs are sufficient to meet all requirements, as no greater number of sheets of such large size could be produced in one turn of eight hours. But when smaller sheets were worked, such as 24 x 72 inches and up to 28 x 96 inches, it was often the case that men would turn out a limit of 135 pairs in six and one-half or seven hours, so that a mill would be idle one hour or more in each turn, or three or four hours in a day. In nonunion mills the workmen operate the rolls practically for the full eight hours in each turn, and in such mills there is no limit placed on output.

The manufacturers complained of the limit on output, not only because it was less than the men could do in a turn when making sheets of the smaller sizes of the lighter gauges, but also because the limitation endangered the chilled rolls. The rolls cost about $350 apiece, or $700 for the pair. The chilled surface on them is about ⅝ inch thick. Every week from 1-32 to 1-16 inch is turned off to make the surface smooth. By this process alone a pair of rolls would be rendered useless within a few months. As soon as all the chilled surface is turned off the rolls get too rough for use. Rolls are liable to be cracked by too much pressure being put upon them. When a crack develops in one of the rolls it soon spreads and, finally, the pressure causes the roll to break. The average life of a pair of rolls with good treatment is 100 days.

Danger to Machinery.

Then, too, rolls are heated from the hot metal which passes between them, and unless the heat is regulated by the output—that is, by the number of hot bars passed between them—the expansion and contraction to which they are subject may cause them to break. On account of the quality of the product as well as the danger of breaking the rolls if the product is limited manufacturers contend that there should be no arbitrary limitation and that the conditions under which the rolls should be operated ought to be left to the judgment of the foreman and the skilled workmen.

The mills shut down on Sundays. For the first day or two after they start on Monday morning the sheets must be rolled slowly, since the cool rolls must be warmed up gradually so as to become heated equally all through. The rolls must have a certain heat to do good work, but the degree of heat varies with conditions. When narrow iron 24 inches or less is being rolled the rolls cannot be made hot enough if the output is limited. When such sizes are rolled 135 pairs can often be rolled in six and one-half hours, and then the rolls will cool for an hour and a half before the next shift comes on; or if the same work were extended so as to be done in eight hours there would have to be an intermission of about ten minutes between each heat, and the successive cooling and heating of the rolls would be very injurious to them.

Rolls cool in the middle first, and when there has been an intermission of an hour narrow iron must be run through the middle to warm the rolls up in that part. If there is no narrow iron to be rolled scrap must be used for this purpose. Judgment is necessary to determine what temperature the rolls should have. The roller is supposed to have good judgment, derived from experience. He judges by the appearance of the sheets. If the rolls are not in proper condition the sheets will be unevenly rolled, causing them to buckle. However, when rolling the wider sizes of sheets it would not be good practice to have over nine heats—that is, to roll over 135 pairs in a turn—for the reason that the rolls would get too hot. One result would be that the brasses, or bearings, of the rolls would soon be worn away.

A Manager's Views.

The manager of a large company, who has had experience in both union and nonunion sheet mills, when interviewed about the union restrictions, said:

> The only way to make rolls work right is to regulate them by the amount of iron passed between them, which controls the temperature. No rolls work properly unless their temperature is carefully regulated. The Amalgamated Association takes this away from the management. Thirty bars are rolled to each heat, which, multiplied by 9, makes 270 bars in a turn of eight hours. There are times when a man ought not to make nine heats. I have seen the time when there ought not to be over seven heats. But often more than nine could be made, because often there is plenty of time for making more than nine.

This manager submitted statistics covering the periods from May 4 to August 31, 1902, and from May 1 to August 31, 1903, to show that average earnings per day were greater in nonunion mills than in union mills, and the conditions were said to be the same. The reason of the greater earnings by the nonunion workmen was that they made more heats and therefore their output was larger.

A large sheet mill in Ohio employed union labor until July, 1903. It then closed down because of the restriction of output to 135 pairs in nine heats imposed by the Amalgamated Association. About 70 per cent. of its former workmen were employed again. This included both skilled and unskilled workmen. The unskilled laborers did not belong to any union. The skilled workmen had belonged to the Amalgamated Association, but they gave up their membership in the association when they returned to work in this mill operated as an open shop. Afterward the men worked full eight hours and their output increased, while the number of "wasters," or damaged sheets, decreased because of the continuous work, and there was less breakage of the rolls. The same piece-price wages were paid after the lockout as before, but the earnings were greater afterward because the production was larger. This was true up to January 1, 1904, when wages were reduced from 15 to 30 per cent. in nonunion mills throughout the country.

At the solicitation of the sheet manufacturers the Amalgamated Association further modified the restriction of output, making it more liberal. This was done at a special convention of the sheet workers held in December, 1903. The restriction was increased from nine heats, or 135 pairs of bars, to ten heats, or 150 pairs, to take effect January 1, 1904. The restriction was modified in

another respect. Before January 1, 1904, not over 135 pairs could be rolled in a day, and if fewer were rolled on some days the shortage could not be made up on other days. The scale as amended provides that 150 pairs shall be the limit of output during the "pay period," which is usually during half a month, employees usually being paid twice a month. If, therefore, only 140 pairs should be rolled on a certain day 160 pairs might be rolled on another day in the same pay period to make the average 150. An officer in one of the largest companies, speaking of this modification, said that the restriction as now applied amounted to no restriction at all, because in no mill is the output greater than that allowed by the scale.

Tin Plate Mills.

In making tin plates bars of steel are heated in pair furnaces and then passed through chilled rolls until they are of the required gauges. In old style mills both the roughing and finishing of plates are done on one pair of rolls. The crew is composed of a roller, doubler, heater, catcher and single boy, and the men very often employ helpers and pay them out of their own earnings. In more modern mills the roughing is done on one pair of rolls and the finishing on another pair. As this is more of a continuous process more men are employed, the crew being as follows: A rougher, a single boy, two heaters, two catchers, an opener, two doublers, a roller and three helpers.

Wages are paid to a team on a weight basis. The scale of the Amalgamated Association provides a limit for turns work by a team. All turns are eight hours, three turns a day. The reason for a restriction of output which union tin plate rollers usually allege is that if there were no restriction the more able bodied men would make large outputs and manufacturers would be inclined to cut down wages. The workmen also seem to think that by limiting the output the number of men who will be able to obtain employment will be increased.

The scale of 1904 established a limit of a turn's work on plates of 8 to 11 gauge of 14,000 pounds, the weight limit decreasing with thinner plates down to 4950 pounds for 36-gauge and lighter. The scale was modified somewhat by the addition of the following proviso:

> On sizes 20½ x 56 an excess of 10 per cent. may be made, but on sizes less than 20 inches wide the per cent. cannot be made; and on 26 inches wide and over an excess of 15 per cent. on the limit may be made.

These modifications were a concession to the manufacturers. It will be noted that there is at the present no average principle in the tin plate scale, as there is in the puddling scale since January 1, 1904. If less than the limit is rolled on any turn the deficiency cannot be made up on any other turn.

An officer in a large establishment in Ohio employing union labor declared that the tin plate restriction was not unreasonable, and he said that raising the limit in 1903 removed all danger of breaking the rolls because of insufficient iron passing between them.

Development of Tin Plate Industry.

An officer of another large tin plate manufacturing company who was interviewed about the limitations on output said:

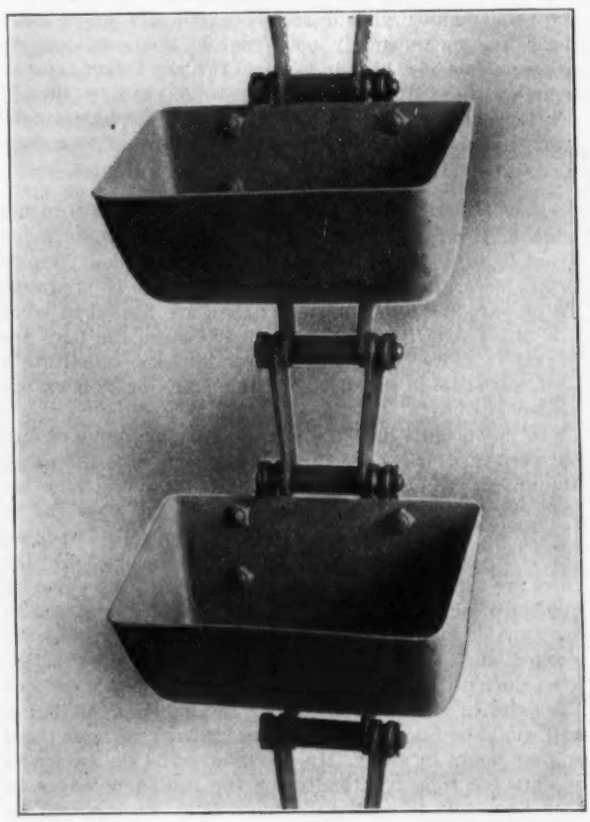
> When the manufacture of tin plates was begun in this country Welsh machinery, methods and customs were largely copied by the manufacturers and men. As there had been little, if any, improvement on the Welsh method of rolling plates for 25 years, the machinery was small and light and the output limited both on this account and by the position of the Welsh labor union, whose greater aim seems to have been the restriction of output.
>
> American manufacturers soon revolutionized the method of rolling plates, and since then have kept up a continual agitation with the labor union to abolish the limit entirely, not alone in order to increase the output on account of the improved mill conditions, but because it was demonstrated that an arbitrary fixed limit, applied to the varying conditions of machinery, to variations of width, length and gauge of plates, and to the varying abilities of men to make output, caused breakage of the machinery, uncertainty in the quality of the product and unnecessary reduction in the output of the mills.
>
> The union, however, has great trouble to keep its members within the limit, even a system of severe fines not restraining the men from breaking over, sometimes practically in a body and sometimes as individuals. It is very questionable whether the union has not increased the limit thus far on account of the importunities of its own men rather than on account of the arguments of the manufacturers.

This company, which has some union and some nonunion mills, submitted tables showing the production of each class of mills. In making up these tables short turns were eliminated—that is, turns in which the weight was only half or less than half what the weight of a full turn's output would be. Such short turns are caused usually by breaks in machinery. One table, covering six months, shows that the average weight per turn in the union mills was 5756 pounds; in the nonunion mills, 6431 pounds, a difference of 11.7 per cent. The second table gives similar information for the first four months after the scale limit was modified. The average weight per turn in the union mills was 6193 pounds; in the nonunion mills, 6480 pounds, a difference of 4.6 per cent.

W. L. C.

The Link-Belt Pressed Steel Elevator Bucket.

For elevator conveyors the Link-Belt Engineering Company, Nicetown, Philadelphia, Pa., is now using pressed steel buckets made in one piece and thus free



Portion of an Elevator Equipped with Pressed Steel Buckets as Made by the Link-Belt Engineering Company, Philadelphia.

from seams and rough surfaces. These buckets are from 20 to 40 per cent. lighter than malleable iron buckets of corresponding sizes. Some appreciation of the uniformity of gauge and the symmetrical design may be gained from the accompanying illustration. The superiority of the new pressed steel buckets over cast buckets is that, due to their compactness and lightness, they obviate the destructive wear on the chain and the sprocket wheels and prolong the life of the elevator. Where cement, sand, grain, coal, gravel and materials of a like nature are to be handled the use of these buckets should prove especially advantageous. Users of japanned or galvanized buckets will recognize the desirability of pressed steel in service where the conditions demand exact special surfaces in the conveying buckets.

The Morgantown Tin Plate Works at Morgantown, W. Va., has been taken over by the American Sheet & Tin Plate Company and arrangements are being made to put it in operation at an early date. It is now a six-mill plant, but will at once be enlarged to a ten-mill plant.

Fractures in Large Steel Boiler Plates.*

BY J. T. MILTON.

Practically the only material which has been used for the plates of marine boilers for many years is mild steel. The question has been recently raised whether the present tests applied to structural steel are sufficient to determine absolutely its quality. It may be at once conceded that the present method of testing cannot determine all the qualities of the steel. What the present system does is to test the tensile breaking strength; sometimes, also, but not often, its yield point; it also determines its ultimate extension, its freedom from taking a temper and its capability of withstanding cold bending. If the properties tested are all found to be normal, it is assumed that all the other mechanical properties will be equally satisfactory and that the material is of good quality. Recent researches, however, show that the tests usually applied may all yield good results, and yet the steel may be unsatisfactory in its resistance to impact or in its endurance of fatigue caused by repeated applications of a stress considerably below the ordinary breaking strength.

In regard to the question of overheating and rolling at too high a temperature, one of the large steel makers of this country made the following experiment: One large ingot of boiler quality was cut up. Three pieces were rolled into 1-inch plate, one being rolled at what is considered to be the proper temperature, one at too high a temperature and one too cold. Pieces were also rolled at normal temperatures and too cold into ½-inch and ¼-inch plates. The pieces of plates thus made were in some cases overheated and allowed to cool and in other cases they were "normalized"—that is, they were heated to bright red and allowed to cool out (the ordinary method of annealing plates); in other cases they had no heat treatment. They were then tested. The results are very interesting and seem to confirm the opinions expressed by the experimenter—namely, that when the steel is initially good, heating the ingot between wider ranges of temperature than should occur in practice with even no more than ordinary care does not have a very prejudicial effect on either the ordinary mechanical tests or even on fatigue tests, the terms "too hot" and "too cold" in these tests referring to such extremes of temperature as would scarcely occur in actual work without very gross carelessness. Further, neither does overheating the finished plates seem to injure them seriously. On the contrary, in some cases it appears to have actually increased their ductility. It must be stated, however, that the experimenter expresses the opinion that in plates where there is considerable segregation the segregated parts might behave very differently under the various heat conditions. Some segregation must exist in all ingots, and therefore also in all plates rolled out of a whole ingot; but when the segregation is slight, seeing that it must occur in the middle of the thickness of the plate near the neutral axis as regards bending stresses, the plates, although inferior to those without segregation, might not be unfit for use.

In view of the very large size of boiler shell plates as now made it is important to know whether these large plates can be made free from initial strains or whether it is inevitable that they should have some strains in them when they are made. Seeing that large plates can be made perfectly flat and free from internal strain it is reasonable that engineers should refuse to receive those that are rolled, buckled or wavy, and should insist that in such cases the steel makers should flatten the plates by taking out the buckles or waves and afterward anneal the plates. Plates should always be delivered to the boiler makers in such a condition that they can use them with confidence without any preliminary straightening treatment. Besides the bad rolling referred to another cause of initial stresses in plates may be their unequal cooling on the mill floor. That this can occur is generally considered to be improbable, but it must be admitted that it is not impossible.

It is earnestly desired that steel makers especially, who have such exceptional opportunities for studying all the properties of the material they make in such large quantities, will absolutely solve the problem why in very rare cases some material of good sound chemical quality, made apparently in the proper way, becomes possessed of such abnormal properties as to become utterly unfit for the purpose for which it is made.

* From a paper read at the summer meeting, July, 1905, of the British Institution of Naval Architects. Mr. Milton is chief engineer surveyor to Lloyd's Register.

A Mammoth Billings & Spencer Drop Hammer.

The Billings & Spencer Company, Hartford, Conn., is constructing a 5000-pound drop hammer which is believed to be the largest friction board lift drop hammer in the world. It is being constructed for the Bethlehem Steel Company, South Bethlehem, Pa. It is to be used in the manufacture of heavy gun forgings which the latter company makes for the Government. The Billings & Spencer Company is working on the hammer day and night and it will be done by September 1, if not before.

The weight and dimensions of this drop hammer are claimed to be in excess of any other drop hammer of this class in the world. The base weighs 72,526 pounds. The uprights weigh 7600 pounds each. The friction rolls weigh 1200 pounds each. The roll spindles, rolls, gears and oil guards are one-piece forgings. The hammer, rough planed, weighed 5600 pounds, and finished weighs 5000 pounds. These forgings were made by the Bethlehem Steel Company. The shoe forging weighed 2240 pounds and the shoe key weighs 160 pounds. The dimensions of driving pulleys are 60 x 13 x 4½ inches. The length of rear roll shaft is 94 inches; that of the front roll shaft 60 inches. The distance between the points of ways is 30 inches; the extreme fall of the hammer is 6 feet 4 inches. The total weight of the machine is 125,000 pounds.

The Billings & Spencer Company has made 450 drop hammers of various sizes and has in operation in its factory 50 hammers. The heaviest is a 3000-pound hammer, the total weight of the machine being 87,000 pounds. The United States Government uses 30 Billings & Spencer drop hammers at the arsenal in Springfield, Mass., and at the United States arsenal at Rock Island there are 46 of these machines. The drop hammer department is running night and day, employing two sets of hands engaged in making hammers for foreign countries.

The Atlanta Tin Plate Mills Enlarged.—The Atlanta Rolling Mill & Tin Plate Company, Atlanta, Ind., maker of tin, terne and black plates, has just completed improvements that will increase its capacity 50 per cent. The plant includes four sheet and four pair furnaces, one annealing furnace and four cold mills. Power is furnished by one heavy duty geared Corliss engine built by the Bass Foundry & Machine Company, Fort Wayne, Ind.; one Corliss engine built by the Bates Machine Company, Joliet, Ill.; one high speed automatic engine built by the Skinner Engine Company, Erie, Pa.; battery of tubular boilers furnished by the Bass Foundry & Machine Company and equipped with Roney mechanical stokers installed by Westinghouse, Church, Kerr & Co., Chicago. The shears, lathes, rolls and smaller tools are each driven by its individual direct connected motor. The plant, as improved, is stated by its manager to have an annual capacity of 14,000 tons of sheet and tin plate. The Board of Directors comprises the following: H. B. Hibben, Indianapolis; W. D. Parr, Kokomo; O. P. Campbell and J. D. Smith of Tipton; A. G. Walton, J. M. Whisler, James E. Henderson, Samuel Mohler and Henderson Coppock, all of Atlanta. The directors held their annual meeting recently and elected the following officers for the coming year: J. M. Whisler, president; W. D. Parr, vice-president; E. S. Walton, treasurer, and W. H. Jones, manager.

The Bessemer & Lake Erie Railroad, controlled by the Carnegie Steel Company, has received a consignment of 1000 steel cars from the Standard Steel Car Company, Butler, Pa.

The Iron Industry of Texas, Present and Prospective.

BY EDWIN C. ECKEL.

The extensive deposits of brown hematite which occur in eastern Texas have been the subject of many enthusiastic reports by mining engineers and geologists, and flattering predictions have been made concerning the part that Texas might be expected to play in the American iron trade. In spite of all this the Texas iron industry is still largely a thing of the future. In a bulletin recently issued by the United States Geological Survey a brief report on these Texas iron ores was included, in which their distribution, origin and geological relations were discussed. In the course of the field work, on which this report was based, the writer collected considerable data on the commercial and engineering phases of the Texas iron industry. These data were necessarily omitted from the Survey report as being more suitable for presentation in the columns of a technical journal, and they consequently form the basis of the present article. For a discussion of the purely geological features of the matter reference should be made to the report above referred to, contained in Bulletin No. 260 of the United States Geological Survey.

Present Condition of the Texas Iron Industry.

The presence of large deposits of brown iron ore in eastern Texas was early recognized, but until the war little attempt was made to utilize these deposits. Iron manufacture began in Texas about 1855, and one small furnace was in operation just previous to the outbreak of war. A decided impetus was given to the industry by the fact that Texas was early cut off from the rest of the Confederacy and was forced to rely upon home industries to supply local demands. A number of small furnaces and bloomeries went into operation and for a time were fairly successful, but owing to outside competition most of them went out of blast shortly after the war ended.

For a number of years no attempt was made to develop the industry, but in 1884 the State built and put in blast a furnace at the penitentiary at Rusk, Cherokee County, and this has been in successful operation ever since. Several other furnaces have been built, but of these only the Jefferson stack has been active during the past few years. Four furnaces are at present in sufficiently good condition to be regarded as possible producers. These are:

1. Sam Lanham Furnace, originally known as "Old Alcalde," located at Rusk, Cherokee County, and owned by the State of Texas. The original stack was built in 1884, rebuilt in 1896 and entirely reconstructed in 1903. The present stack is 65 x 12½ feet and was blown in April 6, 1904. It is equipped with three 60 x 16 foot stoves and has pipe and stove foundries in connection. The ore used is brown hematite, obtained near the furnace; the fuel is charcoal and the capacity is (nominally) 23,000 tons per year of car wheel, foundry and basic iron. Kennedy gives the following analysis as representative of the product of this furnace:

Grade.	?	No. 1 foundry.	No. 2 foundry.
Graphitic carbon	Not det.	1.59	1.68
Combined carbon	Not det.	0.51	0.12
Silicon	2.25	1.90	1.75
Sulphur	0.005	0.014	0.007
Phosphorus	0.477	0.590	0.512

2. Star and Crescent Furnace, located near Rusk, Cherokee County. A 65 x 11 foot stack, blown in November 26, 1891, having nominal capacity of 18,000 tons of car wheel and foundry iron. This furnace was last operated in 1899, but is still in a fairly good state of repair.

3. Tassie Belle Furnace, located at New Birmingham, Cherokee County. This is a 60 x 11 foot stack, equipped with two Weimer stoves, and blown in in November, 1890, having a nominal capacity of 13,500 tons of car wheel pig. Has been inactive for many years, but is still in fair condition.

4. Lone Star, or Jefferson, Furnace, located on Cypress River, about 1 mile northeast of the railroad station at Jefferson, Marion County. This furnace, built in 1890 and blown in March 15, 1891, was in operation until 1904, when it was shut down for necessary repairs. The stack is 60 x 12 feet, with two Durham stoves, and has a nominal capacity of 18,000 tons of pig iron.

The ores used at the Lone Star Furnace were brown hematite, mostly brought in from points along the Missouri, Kansas & Texas Railroad, between Laster and Daingerfield, though some ore from deposits north of Jefferson was also used. This ore is dried or roasted at the furnace. The average stock will analyze: Metallic iron, 55.70 per cent.; manganese, 0.29 per cent.; silica, 13.40 per cent.; alumina, 2.43 per cent.; lime, 1.01 per cent.; sulphur, 0.025 per cent.; phosphorus, 0.151 per cent. The flux used is a pure limestone from Oglesby, Coryell County. Two analyses of this limestone gave 97.67 and 97.84 per cent. of lime carbonate. Charcoal has been the only fuel in use, the wood being obtained locally and burned in 31 beehive ovens. Kennedy places the cost of burning in this district at 5 cents per bushel.

A run in September, 1903, gave the following average charge per ton of pig iron produced: Limestone, 0.21 ton; ore, 1.93 tons; charcoal, 111.10 bushels. The product is an excellent plow and car wheel iron. Five specimens gave an average tensile strength of 22,016 pounds per square inch and an average modulus of rupture of 41,175 pounds.

Available Ore Deposits.

Owing to the character of the east Texas iron ore deposits no concentration of the iron mining industry is possible. Large total quantities of ore may be produced, but this total will come from a large number of openings, each contributing a comparatively small proportion of the entire output. This, however, will not prevent the establishment in northeastern Texas of a large furnace industry, and the various factors which must be considered in connection with such an industry are discussed below.

The brown ores of eastern Texas are known to occur in at least 20 counties: Camp, Cass, Marion, Morris, Upshur, Wood, Harrison, Gregg, Panola, Smith, Van Zandt, Rusk, Cherokee, Henderson, Anderson, Houston, Nacogdoches, Shelby, Sabine and San Augustine. In the counties listed ore districts aggregating 1000 square miles were located by the Texas Geological Survey. Most of the ores of this district occur in approximately horizontal beds, associated with clays and sands. To the miner the one question of practical import relates to the probability of finding at greater depth richer deposits than are now exposed at the surface or in shallow diggings. Fortunately this point is not involved in any theoretical difference of opinion as to the origin of the Texas ores. Under any probable hypothesis of origin two conditions seem to be certain:

1. There is no probability that thicker deposits will occur in depth than those now exposed or worked near the surface.

2. The richest ores will be found at or near the surface.

Deep Mining Impracticable.

If no increase of either thickness or richness is to be expected in depth it is obvious that deep workings will not be commercially practicable. The mining of the region will therefore be confined to working off the immense deposits of iron ore boulders and other surface ores and extracting the ore nearest to the surface. The whole problem is one of handling shallow stripping and of economically working a flat ore bed rarely over 2 or 3 feet thick, but covering great areas. This bed in places will be exposed at the surface, at other points it will be covered by soil and sand varying from 1 to 6 feet in thickness. When the stripping becomes thicker than this it is probable that the ores cannot be profitably worked, for no cheap method of handling heavy stripping can be applied here. Water is too scarce to be used for hydraulicking the surface material, while the location and form of the ore bodies, the occurrence of the workable ore on hills separated by sharp ravines and the thinness of the ore bed will prevent the economical use of steam shovels or other mechanical devices.

The general scarcity of water near the ore deposits has another disadvantage, for it necessitates the working

and shipment of lump ore only. At a few deposits washers may be installed, but for the greater part of the district this is impracticable.

All this may sound discouraging in view of previous enthusiastic estimates of the value of these ore deposits, but the facts may as well be faced now as later. It is true that the ores are rich and that they cover an enormous territory, but it is also true that the deposits are thin and that they are located badly for mechanical methods of handling.

The total amount of ore available is so large and competitive districts are so distant that there seems to be a good opportunity for building up a respectable iron industry. But the individual workings will be small and scattered and the furnaces will probably buy their ore instead of mining it. At present ore can be put on cars at several different deposits for less than $1 per ton.

Character of the Ores.

These Texas ores compare well with the average brown hematites of the Appalachian belt in both content of metallic iron and in the character and amounts of the impurities. The values for certain constituents given in 131 of the anayises of the Texas Geological Survey have been averaged, with the results given in the first column below. For comparison the analysis of a sample of rock ore from the Ore Hill mine of Connecticut, which is the source of the famous "Salisbury iron," is given in the second column, being quoted from Vol. 15 of the Tenth Census reports:

	Average Texas ore.	Ore Hill, Conn.
Iron oxide (Fe_2O_3)	66.39	69.71
Silica (SiO_2)	14.47	9.84
Aluminum (Al_2O_3)	8.17	3.65
Sulphur (S.)	0.083	0.150
Phosphorus (P.)	0.172	0.196
Metallic iron (Fe.)	46.63	50.12
Phosphorus in 100 parts iron	0.371	0.393

Deposits of magnetite and specular hematite occur in Llano, San Saba and Mason counties in central Texas. The magnetites average about 62.38 per cent. metallic iron, 0.17 per cent. sulphur and 0.122 per cent. phosphoric acid, while the specular hematites average 59.7 per cent. metallic iron. Manganese ores occur near Mena, in southwest Arkansas, and also in Llano County, Texas. Large deposits are said to occur in Indian Territory, but no definite information can be obtained regarding them.

Good limestones are obtainable in Coryell County and also near Dallas and Sherman, Texas, and Whitecliffs, Ark. Charcoal is still a cheap fuel, but any large extension of the Texas iron industry would have to consider either the use of producer gas from the Texas lignites or of coal from the Texas or Indian Territory coal fields.

Competition, Markets and Transportation.

The commercial factors remain to be noted briefly. These are: (*a*) The location of competitive iron districts, (*b*) the markets which may be reached by the Texas product and (*c*) the transportation routes, present and possible, which will connect the furnaces with both the markets and the sources of raw materials.

A Texas iron industry would be subject to competition from three sources, very unequal in both capacity and cost of production: A furnace located at St. Louis and a projected furnace at another point in Missouri, using chiefly local ores; the large plants in the Chicago district, working on lake ores; the plants of the Birmingham district, using Alabama red and brown hematite. Of these the Birmingham district would be undoubtedly the most serious competitor, since the cost of producing iron in that district is much less than at Chicago. The Missouri plants, though near, are not large enough nor well enough supplied with cheap ore to be very important.

Unless transportation conditions should change in a very unforeseen fashion the market for Texas iron must be Texas itself, though adjoining portions of Louisiana and Arkansas could be cheaply supplied. East of the Mississippi the competition of the Birmingham district could not be met. Along that river the plants in Missouri and Illinois can easily handle the demand.

In Texas itself, however, there is a very considerable demand for iron products, and this will naturally increase as the State turns from agriculture to manufacturing.

The present railroad system of Texas was not laid out with a view to economies in the iron industry. A more direct connection with the coking coal field of McAlester, I. T., is desirable, and at present there seems to be reason for expecting that in the near future this will be secured.

The importance of Jefferson as a shipping and distributing point would be greatly increased by an improvement of the bayou leading down to the Red River. Since the cutting of the raft Jefferson has been practically deprived of water transportation. The location of Texarkana, on the State boundary, with its excellent railroad connections, points to the possibility of locating furnaces at this point and hauling in all the raw materials.

Cost of Pig Iron Production in Texas.

An estimate made by Kennedy* in 1894 fixed the various items in the cost of producing 1 ton of pig iron in Texas, as follows:

2¼ tons of ore, at 91 cents	$2.05
110 bushels charcoal, at 4 cents	4.40
½ ton limestone, at $1.50	.75
Labor and salaries	1.50
Interest	.30
Repairs and incidentals	.50
Total	$9.50

This estimate seems entirely too low in its total and also in most of the individual items. From the latest census reports the actual cost of production of charcoal pig in Texas during 1900 can be ascertained quite accurately. These figures are given below, and the cost of producing charcoal pig in Alabama, also deduced from the census figures, has been added for comparison:

	Texas.	Alabama.
Raw materials (ore, charcoal and limestone)	$9.24	$10.09
Wages	4.36	1.51
Salaries	.93	.68
Repairs and miscellaneous	.84	.71
Interest charges	2.33	1.45
Totals	$17.70	$14.44

From the figures and estimates above given, checked by data secured by the present writer, the cost of production per ton of charcoal pig in northeast Texas has been estimated as below. This estimate is for a 50-ton furnace located at Jefferson or Texarkana and run on full time:

2¼ tons ore, at $1.20	$2.70
110 bushels charcoal, at 5 cents	5.50
¼ ton limestone, at $1.50	.37
Wages	1.60
Salaries	.70
Repairs and miscellaneous	1.50
Interest charges	.80
Total	$13.17

Both the total and the individual items would of course be subject to considerable variation, depending on the location of the furnace, &c. Bearing this in mind the limit of cost under present conditions may be set at $12 to $15 per ton of pig iron.

Summary.

The establishment of any considerable iron industry in Texas will be favored by the presence of large and cheaply mined supplies of brown hematite ores and of sufficiently large but less available supplies of magnetite, specular hematite and manganese ores. Limestone and chalk for flux occur in large quantities and can be cheaply quarried, but are not located very close to the ores. In regard to fuels, wood for charcoal is still abundant, but gradually lessening. Lignite is as yet an unproved material, while good coking coal can be obtained from the McAlester field in Indian Territory.

The market for such an industry is practically restricted to Texas, owing to severe competition elsewhere from plants using Birmingham and lake ores. Present transportation routes and charges greatly increase the cost of Texas iron, owing to the increased cost of fuel and flux. New routes now in prospect or progress will, however, tend to reduce these charges considerably. The cost of making pig iron in east Texas under present conditions is $12 to $15 per ton.

* Trans. Amer. Inst. Mining Engineers, Vol. XXIV, p. 863.

Lake Iron Ore Matters.

Rains Check Mining Operations.

DULUTH, MINN., August 19, 1905.—More serious rains have fallen over the Mesaba range and there is much delay at many of the big open pit mines of the western end. The rains that have fallen the past few days covered the three shovels working in the Burt pit, filled the open pits of Monroe and Tener and Leonard with water and got into their underground workings to some extent, though these were not raised through to the open pits and did not suffer as badly as might have been expected. There was a river pouring down the north side of Stevenson pit which filled the lower part of the mine. Forest was drowned out and the greater number of open pits between Nashwauk and Buhl were seriously incommoded, if not worse. Indeed, not a mine near Hibbing escaped some delay. In spite of it all shipments are very heavy and the month will not fall much behind July. There is a general feeling, however, that the crest of the movement has been passed and that from now on a gradual decrease will take place.

Older ranges are making a steady product, except where there are labor troubles. These are cropping up to some slight extent, and at Ironwood the Newport and Bonnie shafts of the Schlesinger mines have been shut down on account of a strike of 600 miners. These miners were not satisfied that the day pay of trammers was raised to within 10 cents of their own schedule and demanded a corresponding increase. The tendency on Lake Superior doubtless will be to bring the various classes of underground men to a nearer approximation in the matter of wages, and the trammers, whose work is very hard and as skillful as that of a good many of the miners, may ultimately get pay as good as their coworkers. They do in many Western mines, notably Butte. But the lake miners do not take kindly to any such proposition.

On the Marquette Range.

In the Palmer district there is sure to be a great advance of activity; indeed, the district is now quite alive with old work and the prospects of new. The Oliver Iron Mining Company is negotiating for a lease of the Volunteer mine, belonging to R. A. Alger of Detroit, but no deal has yet been closed. The company had this mine for some time on an option for purchase and dropped the deal. The mine has been the subject of many negotiations during the past few years, but that it is a valuable property seems to be now more generally recognized. Corrigan, McKinney & Co., who operate the Star West, have been sinking a new shaft about 600 feet south of their north line and have been in excellent ore nearly from the surface.

The Consumers' Ore Company is operating one property under lease and A. Maitland another, while the Oliver Iron Mining Company is doing much work at its Moore mine and getting out ore there at a figure that if given would seem impossibly low. The Cleveland Cliffs Iron Company has secured a very large acreage of promising lands almost surrounding the holdings of the Oliver company and will probably develop extensively in due time.

Practically all the district is held by three concerns, those mentioned and the Pittsburgh & Lake Superior Iron Company, whose lands are now idle. A peculiar fact connected with this district is that the Oliver Iron Mining Company is fee owner of several operating mines that are actively in the hands of other parties. This is so contrary to the policy of the United States Steel Corporation that it can only be explained on the hypothesis that the corporation wants the ore ultimately and expects there are such quantities of it that the present lessees cannot mine out the properties or materially reduce them. These Palmer ores are mostly lean Bessemers, some being lean non-Bessemers, hard and quite silicious. But there are quantities of ore in the district that run to 55 and 59 per cent.

There is probably an enormous tonnage in the Palmer district; indeed, it is difficult to make estimates of properties whose ores cover whole quarter sections of land and continue in depth for several hundred feet, and it is safe to say there are many hundred million tons of lean silicious ores that can be mined at extremely low cost. The district has never attracted the attention it should and doubtless will, for the reason that the value of these ores has never been appreciated. Though low in iron they are mainly very low in phosphorus, are hard and highly silicious, making them available for mixtures with low silicon Mesabas, and with the greater and greater use of the latter they will be more and more in demand. Some of these ores are high enough in iron to warrant their mining and shipping on a large scale for their own iron content.

Land lying between the Maas and Negaunee mines of the Cleveland Cliffs Iron Company, in the center of the Negaunee Basin, is to be thoroughly explored by diamond drills. The work will last a year or more and is expected to give very important results. It was by diamond drill alone that the Maas deposits were found, for reaching which the company has since spent about $500,000, and whose ore it will begin to ship in quantity in less than a year.

Drills operated on lands of the Regent group of mines at Negaunee for the Oliver Company have just cut a very promising deposit of ore some 750 feet from the old shaft of the Prince property. This mine was about to be abandoned if no new ore was found by such explorations, as its former workings were about exhausted. The new find will require a shaft.

The Deerwood District.

In the new Deerwood district, west of Duluth, a Crow Wing County, Minn., there is considerable excitement, though so far there are no valuable results except at Rabbit Lake, on a so-called north range, where one explorer is getting ore that is said to assay about 59 per cent. But drills are increasing in number, and after a time there will be enough on the ground to give quite a fair and thorough test, something the few so far occupied would be a great many years in making. Summarized, there are now nine drills working on the range, and one test shaft is being sunk by Pickands, Mather & Co., who found drilling unsatisfactory. Several additional drills will be moved in during the coming month, and it may be that by the close of September the number will be doubled.

The opinion of curbstone experts seems to be that it is not so much a question of where ore will be found in northern Minnesota as where it will not be. But this same sort of talk was heard about 15 years ago, when the Mesaba was originally discovered, and there is yet land in northern Minnesota that does not cover Mesaba deposits.

Among the drilling interests in the Deerwood region is the Northern Pacific Railroad, which has a lot of land nearby. It has four drills working under contract. What they have shown, if anything, is not known. G. G. Hartley and others of Duluth have one drill at work close to the limits of the town of Brainerd; G. H. Crosby has two at Rabbit Lake and expects to start three more shortly, and others have a few in scattered locations. It is said that two or three large iron mining interests aside from Pickands, Mather & Co. are looking up lands and taking options, and it is even reported that the Oliver Iron Mining Company is one of these, but the report may be taken with several grains of doubt.

The Consumers Ore Company has opened a mine in section 13-57-24, adjoining the Forest, and containing a small body of high grade ore. It has been under development for some little time for open pit mining and will make a fair output this year. The same company has closed its new Frantz mine, at Buhl, and will probably do nothing there this year, as its product is not required. Work of developing the property recently bought by the Hobart Iron Company in section 25-58-17, Mesaba range, has begun, and a shaft will be sunk at once. It is to be about 200 feet to the first lift, and it is hoped to ship considerable ore next year. The mine is to be named Hobart. C. F. Babcock, late of Cleveland, has been made superintendent.

Some exploration is under way on the extension of the Mesaba formation west of the Mississippi River, and

several crews are at work on the shores of Pokegama Lake, Itasca County. This work is under control of the Oliver Iron Mining Company and Messrs. Adams, Roucheleau and Whitesides of Duluth. So far there have been no definite results. D. E. W.

Notes from Great Britain.

The Market.

LONDON, August 5, 1905.—With the exception of the sectional steel department it may truly be said that during the past few weeks the iron trade has been stagnant. Of course at this time of the year we look for a slack time, but there are special circumstances inducing weakness at the present time. The renewed tendency to put Cleveland pig iron into store is disconcerting, to put it mildly. The average weekly storings have not been very great, but 5000 tons per week is just now sufficient to engender alarm in some quarters, simply because people feel that there should now be little or no inducement to store iron. The total of Cleveland iron in Connal's warehouses at the end of the month is over 530,000 gross tons, and the position with regard to this weight of metal is somewhat dangerous. It seems perfectly clear that the holders have not yet made any progress in transferring their burden to the trade or to the general speculative public. There are those who believe that a further "squeeze" in warrants is in contemplation and that prices will again be forced up to an extravagant level. Of course the syndicate which acted on the last occasion is quite strong enough to do this and to double, if need be, its holdings of warrants, but there must be urgent need for this procedure before it is undertaken. The warrant market closed at just 1 shilling per ton above the June level, but it must be understood that this price is purely artificial and that ironmasters as a rule are not following it.

In the manufactured iron trade the month has passed quietly, but unexpected strength and firmness were shown by the Associated Bar Iron Makers at their meeting. It has been generally understood that iron manufacturers were badly off for work, but the tone of this meeting seems to contradict the idea. In finished steel a brisk trade has been done right through July, and both makers and merchants appear very well satisfied with the position both as regards actual business current and prospects for the remainder of the year. In semimanufactured material, however, there is certainly less satisfaction for merchants, because the boycott against them by the Germans continues and there is little to be done in American material.

There are frequent complaints that, though consumers have plenty of material, bought when the market was more favorable to them, they are obliged to make small purchases at the present level to keep their mills running. The general quotation for British made Bessemer billets and sheet bars is now £4 10s., and it is found exceedingly difficult to shade it. German material is not much cheaper, and when all the terms are considered it is regarded as of no advantage to buy. From the consumers' point of view the situation is not at all encouraging. They hardly see where it is possible to cover themselves for the increased price at which raw material now rules. Galvanized sheets and black sheets have improved, but not to an extent sufficient to counterbalance the greater cost of production. Both these branches of trade, however, are now in a much more active state than they were at the beginning of the year.

There has been a marked improvement in the engineering and boiler trades of Sheffield during recent months, although there is no mention made of increase in prices. As a sign of the times it is interesting to note that the demand for steel works machinery is by no means confined to the countries that have hitherto been producers, but that a very considerable quantity of machinery for the manufacture of steel is being inquired for from many other countries, and a good deal of such machinery on most up to date and approved lines is finding its way even to China. As an instance, a 150-ton gas fired metal mixer has just been built by Davy Bros., Limited, for that country, and they have at the present moment in hand for the same destination two sets of reversing rolling mill engines of 6000 horse-power each. Another feature of the trade is the considerable demand for presses for forging and other purposes.

Decrease in Exports of Pig Iron.

The decrease in exports to the Continent of British pig iron is notable in the figures for the six months' trading of the present year. In every Continental center for which we have separate figures a more or less serious decline is seen. With Sweden it is nearly 45 per cent., with Germany about 25 per cent., with Holland 20 per cent., with Belgium 15 per cent., with France 45 per cent. and with Italy 33 per cent. The aggregate shortage in tonnage with these six countries is 80,000 tons out of about 280,000, or not far off one-third. How much of this decrease can be attributed to the shortsighted policy which raised the value of Cleveland pig iron to a point out of all proportion to the needs of the occasion it would perhaps be difficult to say, but undoubtedly that policy has interfered very seriously with exports, and the worst of it is that the fall in price which occurred in May does not seem to have stimulated the trade again, with the exception of that to Italy. The next few months may show whether any permanent damage has been done to these important markets.

Profits and Dividends.

The profits for the 12 months ended June 30, 1905, of Guest, Keen & Nettlefolds amounted to £407,557, and there is a balance available for dividends of £545,627. The directors recommend a dividend on the preference shares at the rate of 5 per cent. per annum for the six months ended June 30, 1905, and a dividend on the ordinary shares at the rate of 10 per cent. per annum; to carry to reserve £150,000 and to carry forward a balance of £142,808. The reserve fund will now stand at £750,000.

Foreign Ownership of Welsh Coal Lands.

A great pother has been made of a proposed purchase by a German syndicate of a small coal area in South Wales. South Wales is, of course, famous for its smokeless steam coal, which is in great request by European navies. The Prime Minister took a serious view of the proposal. The Government has been looking into its legal powers to stop the supply of this coal if necessary, and through its Attorney-General has given out the statement that coal suitable for use by vessels of war would fall under the category of naval stores whose exportation can be prohibited. S. G. H.

Reinforced Concrete Ties on the Lake Shore Road.—The widely published statement that the reinforced concrete ties in use on the Lake Shore & Michigan Southern Railway have proved a failure because of the disintegration of the concrete under traffic is denied by Assistant Chief Engineer Rockwell. Writing to the *Engineering News*, he says that practically the only ones that have failed of about 3000 of these ties laid on the Lake Shore line are a few that were laid as joint ties or single ties with seven or eight wooden ties between them. Whether due to the harder pound at the joints or their rigidity over the wooden ties some of these have split. With the ties laid to a face there have been practically no signs of trouble so far. Some of these ties were made from gravel which had some stones in it that slaked and burst open some of the thinner portions of the concrete, but this was not the fault of the tie. More of them are being made for Lake Shore tracks. They are the invention of C. Buhrer, roadmaster at Sandusky, Ohio. Other roads have about 1200 in use, and in all 5000 have been made. The reinforcement consists of a 165-pound length of 65-pound scrap rail, inverted. The flange forms the seat for the track rail and the attachment for the fastenings. It is proposed, however, to use a rolled section which will weigh about 80 pounds. The ties as now made weigh about 400 pounds.

According to a bulletin of the Census Bureau the commercial value of the railroad property in the United States is $11,244,852,000.

THE IRON AGE

1855—1905.

New York, Thursday, August 24, 1905.

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Adjustments of Capacity to Demand.

A perfect adjustment of the country's iron and steel producing capacity to its requirements probably never existed. It is the lack of this adjustment that causes sudden uprushes of prices in times when demand comes on like a freshet; and depressions are always intensified by the temporary excess of capacity that results from the simultaneous effort of a number of producers to provide facilities for a larger business. It has been characteristic of many engaged in iron and steel manufacture in the United States that when full-tide prosperity prevailed in the trade they found difficulty in believing that it would ever recede to anything like the low points previously touched; and when depression actually came again they could not be persuaded that high prices and a demand straining every resource would ever return.

Steel manufacturers have considered that they have a grievance against the railroads for pressing for large deliveries of material within a short period when every other buyer is also insistent and then withholding business for months. Yet there is a parallel to this policy in the habit the iron trade has of making its most important additions to plant when times are good, prices highest and construction material and machinery hardest to get.

Not only are there alternations of insufficient and more than sufficient iron and steel capacity, but there is a continual shifting from one side to the other of the balance between pig iron and steel making capacity, and finishing capacity keeps getting out of line with both pig iron and steel. To-day the finishing capacity of the country is in excess of the ability of producing agencies at the other end of the line to keep it fed to its full limit. This statement is not contradicted by the fact that while the country's full blast furnace capacity is not now employed finishing mills in the heavier lines are running full and yet cannot make promised deliveries. The abnormally heavy production of sheets and tin plates in the early months of this year for reasons apart from market considerations accounts for some temporary dislocation of the relations between primary and finishing operations. It is to be remembered also that the real relation between the two ends of the producing machinery cannot always be judged, because a steel plant built in connection with a certain description of finishing mill that may be temporarily idle cannot be run economically to help out a finishing plant in another line that might just then be able to finish more steel than it was getting. The slacking of sheet and tin plate operations in the early part of the summer caused the shutting down of some blast furnaces and steel works that might have been employed had they been connected with a rail mill or a structural mill.

It is now three years since the last campaign of new construction in iron and steel works was at its hight. It is a safe prediction, moreover, that the period of heavy consumption of steel products in which the industry now finds itself will bring along with its heavy tonnage a new stir in the building of additional capacity. Three years ago 34 blast furnaces, representing an annual capacity of more than 4,000,000 tons of pig iron, were under construction in the United States. It was the feeling throughout the iron trade that the boom then on would be succeeded by a period of dragging prices and keen competition, and that furnace building was being much overdone. It has been demonstrated since the beginning of 1905 that all the new capacity completed in the past two or three years was actually needed. The statistics of July 1, 1905, showed 11 blast furnaces in process of building, with an annual capacity of about 1,000,000 tons.

The history of all new construction in iron and steel works is that no little time is required to convert these projects into actual producing factors. Some of the companies whose building operations in 1902 were considered such a menace to the stability of the steel trade have proved to be in no sense disturbers of the situation, their actual output in certain finished lines being much less than it was expected to be by this time. Judging by the history of some of the large plans for new competition that have been unfolding since the formation of the United States Steel Corporation it would take several years for any important steel works projects that might now be undertaken to materialize as well organized factors in iron and steel production. With no such projects on foot, the promise is for the preservation of substantially the present status in steel making capacity for many months apart from some additions to existing plant that are already under way.

The apparently fixed policy of the United States Steel Corporation to export about 1,000,000 tons of billets, sheet bars and finished material means that a certain proportion of existing capacity is to be reckoned as unavailable hereafter for any unusual pressure of home demand. Yet it is only the repetition of familiar history to find that what promised three years ago to become an unmanageable surplus of capacity for the production of pig iron, steel and finished material turns out to be a really timely adjustment to a new "normal" requirement. When the structural mills now under construction in the Chicago and Pittsburgh districts are in operation and the new mill in the Buffalo district comes nearer its expected output the one undeveloped factor in finished lines will have been brought into alignment with the rest.

A Menace to the Automobile.

It is not to be wondered at that manufacturers of automobiles should express themselves as a number of them have done of late concerning automobile track racing. Nothing but harm can come to the automobile industry from having its product classed among implements of destruction, for such the modern racing machines certainly are. The track events in which automobiles are driven by professional racers bear about the same relation to sport as a Spanish bull fight. Two of these races last week resulted in terrible injuries to two drivers, and there is not an event of this sort that does not put in jeopardy the lives of scores of spectators. The record of the long runs across country is likewise one of fatality and maiming. As with every other mechanical invention the place of the motor vehicle is to be made by its service to mankind. High speeds in competitive driving determine nothing that has a legitimate bearing on the efficiency of these machines under conditions of actual

service. Moreover, by advertising the automobile as in practically the category of war munitions, track racing only retards its advance to a permanent place in urban transportation.

Since some of them have gone on record as in favor of an agreement to abolish racing as a means of advertising their machines, it might be in order for the manufacturers of automobiles to consider whether the factor of speed has not been altogether overworked in the competition of the various forms of motors. In spite of the confident assertions that the motor vehicle has come to stay it is evident that the many accidents attending its employment in travel for pleasure have caused an accumulation of sentiment that must be reckoned with. Inevitably some phases of the present vogue of the autocar will pass away. When cheaper machines come and buyers multiply the second stage in the movement will have arrived. After that the solution of the problem of greater safety will determine whether the industry shall continue on its present lines or whether it shall eventually find its chief development in the field of heavy haulage, with the motor displacing the truck horse of to-day.

Selling Machinery for Securities.

A most undesirable result of competition in some lines of machinery manufacture is that of being compelled to accept the stock of customer corporations in payment for goods sold. The electric companies have suffered a good deal from this sort of thing, though in some instances they have made money by the successes of such customers. The textile machinery manufacturers have fared even worse. Machine tools have been sold on the same basis, and so has pretty much everything else in the line of the more costly shop and mill equipment. It is never a welcome means of selling goods. It often ties up money in the hands of people of whom the manufacturer can know little or nothing. The corporation may succeed and the machinery manufacturer may then unload his stock and increase his original profit. But it is more likely to happen that the stock will remain on his hands, perhaps earning dividends and perhaps not, or the worst may occur and the stock become worthless.

The existence of stock payment for goods as an established custom is one of the reasons for the recent combination of cotton machinery manufacturers of New England. In their sharp competition it had become necessary to deal in cotton mill stocks in the place of cash. The element of speculation was altogether too much in evidence. It was frequently the case of either trusting to the unknown business ability of a new man entering the cotton business or else losing the chance to equip his mill. Naturally all were forced into it to a greater or less extent. The consequence was that when the proposition was made to form a commercial alliance, partly by combining various companies and partly by a business agreement between the combination and those companies outside of the merger, it was found to be a comparatively easy matter to effect a successful culmination of the plan.

It is a pretty safe maxim that nothing can take the place of cash or its immediate equivalent in the conduct of a manufacturing business. Machine tool manufacturers sometimes swap machinery in simultaneously buying each from the other, which is good business for both. But there is something repugnant to business methods in selling a man a lot of machines and receiving in exchange a stock certificate the value of which may be doubtful. It may not be too much to say that in most instances the buyer of machinery who has nothing but stock to give in exchange for goods should be regarded in the class of doubtful credit, for stock taken under such circumstances as these is hardly different from an unindorsed promissory note, in the sense that the failure of the maker means a loss to the holder. There are exceptions, of course. It sometimes happens in the machinery world that a new machine industry numbers among its stockholders manufacturers of the equipment that goes into a machine shop and they furnish the machinery, boilers, engine, &c. But before they do this they learn the merits of the proposition and go into it as a business investment pure and simple, usually investing their surplus private income. It is a different thing entirely if the machine tool manufacturer furnishes the tools for the repair shop of a new cotton mill, taking stock in payment and without knowing the ability of the manager of the business. It should be a rule that payment must be in cash, and a union of manufacturing interests that will drive stock payments out of their line of trade can do nothing but good to business generally.

The World's Production of Finished Iron.

In our issue of July 20 reference was made to the production of rolled iron in the United States in 1904, which amounted to 1,760,084 gross tons. This total compared with 2,518,194 tons for 1890, the last preceding year in which the statistics of rolled iron production had been gathered separately from those of steel. The London *Iron and Coal Trades Review* combines these figures with those of other countries and to the discomfiture of the prophets of the extinction of the puddling industry. The production of rolled iron in leading countries in the past two years is thus stated:

	1903	1904.
United Kingdom (gross tons)	950,390	936,228
Germany (metric tons)	819,832	765,197
France (metric tons)	589,910	554,632
Belgium (metric tons)	401,550	360,520
Russia and other European countries (metric tons)	850,000	800,000
Totals	3,611,682	3,416,577
Add United States (gross tons)	.....	1,760,084
Grand total	.....	5,176,661

Estimating that with all countries included the world's production of rolled iron was about 6,000,000 tons last year, our contemporary points out that there has certainly been no extinction of the finished iron industry and that these products are evidently as much appreciated as they ever were and deemed quite as indispensable.

In 1880 the output of finished iron in the United Kingdom, the United States, Germany, France, Belgium, Austria-Hungary, Russia and Sweden was 8,553,225 tons, and in 1890 8,340,599 tons. Last year the world's output of steel ingots was about 36,000,000 tons, so that the ratio of steel to iron was substantially 6 to 1.

The Baltimore Restoration.

Far better than the prophets found any promise of, as they set forth the disasters that were to flow from the great fire in Baltimore in February, 1904, has been the outcome of the rebuilding movement. A loss of $75,000,000, to say nothing of the crippling of business for a long time after the fire, was well calculated to create depression. There could be no expectation of an influx of new life such as swept Chicago on to a new high point in population and in trade following the $200,000,000 fire loss of 1871. The settled life of the Monument City presents some contrasts to the restless, buoyant spirit that led the Chicago community of 1871 on to its

splendid triumphs. But the restoration at Baltimore not only confounds the faint hearted prophets, but gives real occasion for the pride with which the newspapers of that city now point to the achievements of the past year and a half. There were delays, but these were really due in part to a public spirited movement which sought to turn the disaster to account by acquiring sufficient property to widen a number of streets.

By the erection of buildings on 770 lots out of 155 acres of fire swept territory, on which stood 1382 buildings before the fire, we are told by the Baltimore press that the city now has "a business center superior to tnat of any other city in the world." While $15,000,000 represents the outlay for structures built by private expenditure, it is stated that the rebuilding movement has been accompanied by an outlay of $100,000,000 on docks, parks and other important public work, largely due to the quickening of local spirit in the revival following the fire. Chicago was able to say two years after her fire that laid waste 2100 acres that all traces of the conflagration had disappeared. And in the decade following 1870 her population grew from 298,977 to 503,185. The Baltimore record is not so sensational, but it represents a magnificent achievement that means great things for the commercial life of the city in the years just ahead.

CORRESPONDENCE.

Steam Moved Valve Gears.

To the Editor: One of the first steam moved valve gears ever constructed in this country, if not the first, was that invented by the late Norman W. Wheeler, an old time American engineer of extraordinary ability and versatility. At the Morgan Iron Works in 1853-1854 he built a steam pump with self opening valves which had no external tappets or levers of any kind. It was merely two cylinders, water and steam, opposed to each other, which worked the live steam valves by the exhaust. As I recall now, after half a century, it had trick ports and poppet valves. The exhaust passing through the trick port lifted the live steam valve for another stroke of the piston, the exposed area of the exhaust valve being larger than that of the live steam valve by enough to overcome the load on it at certain pressures. I saw this pump in operation. It gave no trouble when it was running full speed, but when it was desired to run slowly the pump ceased to operate at certain times and nothing could be predicated as to its action. Mr. Wheeler subsequently introduced the self acting piston valve pump, so well known to-day. He died a few years ago in Greenpoint, L. I.

Steam moved valve gears are no novelty as to inception and even construction, but the instances where they are in constant operation are few and far between. One that I recall was merely an auxiliary engine erected below the slide valve of a large marine engine, which it reciprocated. Exactly what was to be saved by it over the usual eccentrics and links was never explained. It merely doubled the chances of a breakdown, besides entailing supervision of twice the number of parts that are in the common valve gears. The steam distribution was not affected in any way, and the points of cut off remained identically the same. EGBERT P. WATSON.

ELIZABETH, N. J., August 14, 1905.

The second of the two tubes which are being constructed under the Hudson River by the New York & Jersey Railroad Company will be completed in about six weeks so far as the actual boring is concerned. The northern tube was completed in March, 1905. It is expected that trains will be running from Jersey City to the terminal at Christopher and Morton streets, New York, in the spring of 1906, and 18 months later the extension under Sixth avenue to Thirty-third street will be ready for service.

Water Powers of the Southeastern Appalachian Region.

Great Opportunities for Electrical Transmission.

A paper of unusual interest bearing upon the development of the water powers of Virginia, North Carolina, South Carolina, Georgia and Alabama was read at the twenty-second annual convention of the American Institute of Electrical Engineers at Asheville, N. C., in June, 1905, by Frederick A. C. Perrine. The waterfalls of the South form an important element in its industrial development, and the writer chose the powers in the five States named because in these States the most far reaching effect seems to wait upon the utilization of their falls. The people of these States, Mr. Perrine says, have most thoroughly grasped the importance of the problem; great cotton factories have already sprung up and the developments so far effected have shown important results.

Factors Favoring Power Development.

In the States named the Appalachian system is represented by the Shenandoah, Greenbrier, Blue Ridge, Black and Great Smoky mountains. The region is pre-eminently a water power country. The paper points out that the rainfall over its entire extent is in no part less than an average of 35 inches, increasing to 60 inches in the mountains. The soil is generally porous, and for those streams from the head waters of which the forests have not been cut the rainfall is retained and neither floods nor low water are as serious difficulties as are encountered in the Middle States. Ice and snow are not important elements in the problem, which is not only a condition favorable to hydraulic development, but also to the problem of transmission line maintenance. The rivers fall rapidly to a well defined fall line, where they enter the plains along the seacoast and in some cases become navigable. Above the fall line they present many opportunities for power development of high head in the mountain region and of low head between the mountains and the fall line, along which portions of their course they flow over many rapids, which in that region are called "shoals." Lightning storms are frequent and severe and present one serious problem. Another is the immense quantities of silt carried by the rivers. Of Mr. Perrine's elaborate discussion of the available waters in the region we present an abridged version below:

Commercial Considerations.

The fact that Southern industries rarely operate more than 11 hours a day requires a most careful study of the opportunities for storage, which will enable the full use of the river during this working period of each day. The most serious commercial problem is that of competition. On account of the abundance of water and the number of power sites, few powers in the entire region are so situated as to be immune from dangers of competition from powers of equivalent cost and equal accessibility to the market. This seems to require more than in any other part of the country the development and distribution of the powers from many plants under one common management. Duplication of plants reduces the necessity for duplication of lines and tends to make the power more useful and reliable.

The manufacturers of the South, as in New England, have for many years been accustomed to appreciate the value of water power to their steam plants, and of the steam plant as an auxiliary to the water power; in consequence, a market for power beyond the amount of the minimum stream flow is readily obtained, and should always be considered in planning for developments in this territory. A great proportion of existing plants are constructed directly at the dam site, with little or no canal or penstock construction required, and entailing little expense for the development of excess power except the actual cost of the machinery and its foundations, with the necessary covering roof for including it in the power house.

Principal Sources of Power.

The principal rivers of the Southeastern Appalachians whose drainage basins need to be considered are

the James, Roanoke, Staunton and Dan rivers, in Virginia; the Cape Fear, Yadkin and Catawba, in North Carolina; the Catawba, Broad, Saluda and Savannah, in South Carolina; the Oconee, Ocmulgee, Flint and Chattahoochee rivers, in Georgia, and the Talapoosa, Coosa, Tuscaloosa and Tombigbee rivers of Alabama. There are many tributaries and some of the rivers change their names from source to mouth.

The northernmost region selected for study is the drainage basin of the James River, having at Richmond an area of about 10,000 square miles. This river gathers its waters from streams flowing northeasterly and southwesterly among the Allegheny, Shenandoah and Blue Ridge Mountains and carrying them entirely across the State of Virginia in a general easterly direction empties them into Chesapeake Bay. The fall line is not reached till at Richmond, where there is an abrupt descent of 84 feet to the tide level just below the city. The James drains an old, well cultivated portion of the country, having an average rainfall of about 41 inches. The minimum run off is 0.20 sec-ft. per square mile, and the maximum 20 sec-ft. An average of 0.35 sec-ft. may be expected over a three months' period. Toward the headwaters the variation of flow is even greater than nearer the mouth, on account of the fact that the mountains here are low and little snow falls upon them, and they are largely denuded of trees. The average fall of the James from Richmond to the headwaters is about 4.25 feet per mile, excluding the sharp fall at Richmond; in consequence of this rapid flow, exhibiting many opportunities for power development, as the fall is uniformly distributed along the river.

The Roanoke River drains the western portion of Virginia south of the watershed of the James, and at Clarksville, Va., is formed by the Staunton and Dan rivers. The Roanoke crosses the fall line of North Carolina at Weldon, 120 miles from the mouth of the river, where the total drainage area of the watershed is about 9000 square miles. Near Weldon there is a sharp fall of over 100 feet in less than 5 miles; otherwise, both the Staunton and Dan rivers flow with insignificant grades till near their headwaters. The rainfall along the Upper Roanoke and the Staunton averages about 46 inches and along the watershed of the Dan about 47 inches; yet the run off from these rivers is very variable on account of their draining principally tableland and receiving little from the mountains. The minimum flow is 0.16 sec-ft. per square mile, and the maximum about 10 sec-ft. The floods along these rivers rise suddenly.

The Factor of a Ready Market.

South of the Dan River basin the Cape Fear River drains a region in the center of North Carolina. Although the watershed is principally covered with clay and sand and comprises pine and oak forests and agricultural land, and in spite of the fact that there are no great falls in its course, except at Smileys Falls, still it is one of the most completely developed power rivers of the South. The rainfall over this watershed averages 50 inches, the greatest fall being in the spring and summer. The monthly average run off is not more than 0.12 sec-ft. On the other hand, the floods are very severe, running from as high as 15 sec-ft. in May to 20 sec-ft. in January. That a stream with these difficulties to be encountered should have been so well developed shows plainly the importance of a ready market in problems of power development, and the effect of even an unreliable water power in developing manufacturing in a country where the conditions of market, raw material and unsatisfactory labor are favorable.

The Yadkin River of North Carolina, or the Great Pedee of South Carolina, drains above where it crosses the fall line at Cheraw, S. C., a territory of about 9700 square miles. Except in the rapids at Cheraw and at the Yadkin Narrows, 55 miles above, there are no important falls, though there are on the watershed a number of opportunities for development by high dams forming storage reservoirs. The rainfall in the mountain region along the headwaters of the Yadkin averages in excess of 55 inches, but over the greater portion of the watershed it amounts to about 46 inches. For the average year the run off is at a rate no lower than 0.32 sec-ft. The floods frequently run as high as 30 sec-ft., but with few monthly averages rising above 5 sec-ft. per square mile. The course and drainage area of the Catawba are much similar to those of the Yadkin. Near Camden, S. C., it crosses the fall line; just above are not only the customary rapids, but a few miles further north one of the most remarkable power sites in the South, a total fall of over 150 feet being available for development.

The fall of the river is not so gradual as the Yadkin, but concentrated in falls, many of which are available for developments of considerable size. The drainage area at Camden is about 5000 square miles; in the upper half of this territory the rainfall averages about 50 inches and in the lower half about 45 inches. Almost the whole territory is heavily wooded and in consequence the run off is comparatively uniform.

West of the watershed of the Catawba lies the Broad River, which rises in the Blue Ridge Mountains east of Asheville and flows southeasterly to Columbia, where it joins the Saluda to form the Congaree. The latter flows into the Wateree and forms the Santee. There is no point at which the Broad crosses the fall line, but it lies altogether in the uplands. The slope is great, averaging about 4.5 feet per mile for 140 miles from its mouth. A number of favorable opportunities are presented for development, notably near Alston, S. C., and near Gaffney, S. C. The drainage area at Gaffney is approximately 2000 square miles and at Alston about 4600 square miles; the total drainage area of the watershed is about 4900 square miles. The soil over the watershed is generally sandy and a large portion is wooded; in consequence the run off is well distributed, not having been found to fall below 0.35 sec-ft. per square mile.

The watershed of the Saluda directly to the west of the Broad is similar to that already described; but with a total length of about 135 miles the area of the watershed is only about 2000 square miles, and neither the maximum flood rate nor the minimum run off rate is as high as on the Broad.

Important Georgia Powers.

The Savannah River, which at Augusta drains a territory of about 7300 miles located almost equally in South Carolina and Georgia, promises to become the source of some of the most important water powers in the South, not only because the stream flow is good and the shoals well adapted to development, but particularly from the favorable economic situation of the water power sites. The territory on both sides of the river is an important cotton growing section and its adaptability for mills has been well proved; in fact, Augusta, Ga., is the largest cotton manufacturing city in the whole South. The industries of that city have been built up about a 50-foot fall in the Savannah, at that point where the river crosses the fall line. The minimum flow will run as low as 0.50 sec-ft. for from four to six months. The maximum is about 25 sec-ft.

The middle portion of the State of Georgia is drained by the Oconee and Ocmulgee, which at Milledgeville and Macon, respectively, cross the fall line—a territory of about 6000 square miles. The rivers are comparatively steep and present a number of opportunities for power development. The flow is comparatively low, often during several months of a year falling to as low as 0.2 sec-ft. The maximum flow of 20 sec-ft. occurs in the spring.

To the southwest lies the drainage area of the Flint River which crosses the fall line at Albany and follows the Blue Ridge Mountains practically to the end in a rapid flow. This river presents the anomaly of frequently being at its lowest during November, a great disadvantage in a power river, as the yearly load curve of most industries is generally rising at that time.

The last four watersheds described are headed in the Blue Ridge Mountains which run southwest through Georgia. Across the mountains and running parallel to them is the watershed of the Chattahoochee River which runs rapidly down between the lower extensions of the Blue Ridge and Great Smoky Mountains. In consequence of being located almost entirely in the mountains it pre-

sents many desirable characteristics as a power stream. The minimum run off falls to a rate of 0.25 sec-ft. The flood flow amounts to about 20 sec-ft.

The great drainage area of the Mobile watershed covers practically the whole of the State of Alabama and extends into the northwestern corner of Georgia and the northeastern corner of Mississippi. The greater portion is mountains and well wooded; in consequence there are many valuable water power sites. Some of the highest heads available in the eastern States are in this territory. The development of the coal and iron mines and the manufacturing to which these raw materials give rise furnish opportunities for the power market, though the presence of coal mines renders caution necessary in selecting sites for development.

In this watershed are reported sites for development aggregating 150,000 horse-power. The country is mountainous, but so far south that these mountains carry no snow and the evaporation is high; hence the minimum rate of run off is never high. A minimum rate of 0.2 sec-ft. per square mile will be found in any important Alabama river.

Water Powers a Great Asset of the South.

In this short review of the water powers of the southeastern Appalachian region an attempt has been made to convey some impression of the wide distribution of water power in this territory. Already the development of a few of the available sites has had a powerful influence on the commercial life of the South, and in the contest for industrial supremacy which is continually being waged between sections of our country the ready availability of water power in the South is certain to play no unimportant part. The conditions are in all respects different from those in other sections. There is no location which can command the field, and within a comparatively short distance of each plant is another location which may offer competition. The minimum flow is everywhere small and the floods heavy, varying from 75 to 150 times the minimum. But, on the other hand, a class of manufacturers are at hand who appreciate the value of water power even when it is variable, and are accustomed to providing themselves with steam auxiliaries for allowing the use of surplus water power. These conditions are on the whole favorable to the development of water power on a large scale, but point to the necessity for effective management and a comprehensive plan for the development of a section of territory rather than of a single power.

With efficient business management and careful engineering we may expect the water powers of the southeastern Appalachian region to prove to be one of the most valuable assets of that wealthy section of our country.

THE PRESERVATION OF APPALACHIAN STREAMS.

Closely related to Mr. Perrine's paper was a brief one by Charles Edward Waddell, presented at the same convention, on the "Preservation of the Southern Appalachian Streams." The writer deals with the question of forest preservation in the Southern Appalachian plateau, taking in portions of North Carolina, Tennessee and Virginia. The eastern and western boundaries are the Blue Ridge and Unakes, respectively. This plateau is the source of magnificent rivers flowing to the four points of the compass, these including the New (which becomes the Kanawha), the Yadkin, Catawba, Saluda, Broad, Toxawey, Tallulah, Chattahoochee, Pigeon, Watauga, Hiwassee, Little Tennessee, French Broad, Nolichucky and Holston. They have a combined drainage area of over 78,000 square miles. The majority of these rivers possess fine water powers, the value of which depends on uniformity of flow rather than on quantity. Regularity of flow is influenced by erosion of the hillsides and by floods.

The writer showed that on steep slopes where the land is cleared one heavy rainfall can do as much damage as would be caused in years if the same slopes were covered by forests. He cited instances of heavy loss by erosion, the mountain torrents carrying down stones and other *débris* and depositing them on rich agricultural land or in the pond of some developed water power. In 1901 the loss on the Catawba alone amounted to $1,500,000, and the total loss for the year on all streams was $10,000,000. Property 200 miles from the mountains was damaged.

Government gauging stations report increasing irregularity in the streams of the Southern Appalachians. Investigation led to the conclusion that it is due to the removal of the forests. In a few decades lumbermen have made serious inroads. Some of the smaller streams whose headwaters are denuded dry up altogether at certain seasons. Surface run off is the cause of rapid fluctuations, while the perennial springs and underground drainage furnish the permanent supply; therefore, regularity of flow is secured if the run off is diverted into storage. This is the part the forest performs. Its factors of conservation are lower temperature, shade, capacity of the humus and the retarding of evaporation by protection from strong air currents. Benefit is also derived from the mechanical action of the trees in breaking the fall of the raindrops, thereby protecting the soil, and to the obstruction offered by the roots to the rapid run off of the precipitation. The roots further assist by increasing percolation through keeping the ground open and porous. The forest cover protects snowfall from rapid melting, and the snow in turn protects the earth from freezing, thereby keeping it open and susceptible to filtration when the snow does melt. Evaporation is much more rapid from bare tracts than from wooded areas; this is especially true of the mountains, as the greater the altitude the greater the effect in preventing evaporation.

The stream preservation of the Southern Appalachians depends solely on the forests; in this respect it differs from New England, where glacial deposits and the lakes co-operate with the streams. In the South both the deposits and the lakes are lacking. The expedient of planting grasses that have been found to flourish in New England and to protect the soil subsequent to the removal of forests is not successful in the South, due doubtless to the greater heat and consequent parching effect.

The paper argues that woods at the headwaters of the streams should never be removed. Valleys alone are suited to agriculture. Cleared mountain sides yield at most four or five crops; the land then becomes impoverished. Timber should be cut in a way that will protect young trees. The efforts made in reforesting on the Biltmore estate are referred to in the paper. Where hillsides have been graded rhododendron and kalmia roots are introduced, resulting in the formation of new soil. In the forests plantings of seedlings take the place of matured trees as the latter are removed in lumbering. The results of these methods are to-day apparent in the condition of the brooks and streams. The deposit of sediment is materially less than on the streams not so protected and the streams are not so turbid subsequent to heavy rains. The French Broad River, with its tributaries above Asheville, drains the Biltmore estate, and the fact that statistics show the French Broad to vary less than any other stream in the South Atlantic States may be attributed to the protection the river receives from intelligent reforesting.

British Foundrymen's Association.—The second annual convention of the British Foundrymen's Association, an organization for the discussion and study of cast iron and of foundry practice on lines similar to those on which the American Foundrymen's Association works, was held at Glasgow August 7 to 9. The present membership was reported to be 121, as against 83 last year. The following papers were read: "Technical Education and the Foundry," by Professor Sexton, Glasgow; "Cast Iron," by Herbert Pilkington; "Molding Sands and Fire Clays," by Percy Longmuir; "The Microscope and Pig Iron," by A. Campion; "Profitable Founding," by John G. Stewart. Visits were paid by the members to a number of foundries and steel works. An exhibition of micro-sections of metals and of photomicrographs was made in the laboratory of the Glasgow and West of Scotland Technical College, at which the meeting was held.

Billets Exempt from Canadian Dumping Duty.

TORONTO, August 21, 1905.—The special, or "antidumping," duty on steel billets imported into Canada is temporarily suspended. The period during which they are exempt from it began July 24 and will close September 30—68 days in all. Besides this time limitation there is a quantity limitation. The quantity imported for any rolling mill or forge is not to exceed 25 per cent. of the total quantity rolled or wrought in its works during the calendar year 1904. The bulletin issued on the subject by John McDougald, the Commissioner of Customs, is as follows:

Collectors of customs may grant permits for the importation of steel billets for use in iron or steel rolling mills and forges between July 24 and September 30, 1905, on payment of ordinary duty without special duty, subject to the following conditions:

1. The quantity of steel billets imported for any such rolling mill or forge shall not exceed one-fourth of the total quantity of steel billets rolled or wrought in such mill or forge during the calendar year 1904, such quantity to be established to the satisfaction of the collector at the port of entry upon declaration in writing made before the collector by a principal official of the rolling mill or forge having knowledge of the facts.

2. The rolling mill or forge for which the steel billets are required shall be described on the application for importation and on the face of the entry for duty.

3. The steel billets shall be imported and entered for duty on or before September 30, 1905.

At the present time, therefore, and until the end of next month steel billets thus restricted in importation are subject only to the general duty of $2 per ton. Of course billets coming from Great Britain are entitled to one-third off for the preference, making the net rate in their case $1.33 1-3 per ton.

The suspension of the antidumping duty is not effected by the passage of an order in Council—the usual mode by which emergency abatements of the law are temporarily made—but by a regulation of the Customs Department. Authority to exempt articles for a longer or shorter period is conferred on the Department by a subsection of the Special Duty legislation, which subsection provides that regulations may be made for the temporary exemption from special duty of any article or class of articles when it is established to the satisfaction of the Minister of Customs that such articles are not made in Canada in substantial quantities and offered for sale to all purchasers on equal terms.

It will be observed that the regulation is framed to prevent speculative importation of billets. If the antidumping duty had been unconditionally removed for the 68 days in question advantage might have been taken to rush in large stocks to be held and sold for future requirements. Persons not in the steel rolling mill business at all might have accumulated supplies to be thus disposed of after the duty should be reimposed. But, in the first place, all such nonmanufacturing speculators are excluded by the requirements of the regulation that permits must be obtained from the local collectors and that the issue of these must be restricted practically to owners of rolling mills and forges. In the second place, even these manufacturers are debarred from speculative importation by the limiting of their imports to 25 per cent. of the quantity they used last year.

As the rolling mill and forge interests are the only ones eligible for the exemption the quantity imported under the privilege is sure not to be large. There are several conditions to keep it within narrow bounds. First, their total rolled product in 1904 was not large, for it was not until the early autumn of that year that the duty on rails was brought into effect, thus giving a start to the rolling mill industry. Steel rods had already been made in Sydney and some tonnage of structural forms had been produced, but the total rolled product for the year was comparatively small, far below what will be shown this year. Twenty-five per cent. of that quantity will not be a material quantity in the steel trade of this year. Second, every ton of billets which is brought from outside instead of being made in Canada will mean the loss of $1.10 in bounty, for that is the amount per ton to which the bounty on raw steel declined July 1 on the sliding scale arrangement. No abatement of the antidumping duty will compensate Canadian steel mill interests for that loss. In fact, it is improbable that the waiving of the antidumping duty will prove of any advantage to the Sydney and the Sault Ste. Marie mills, for it is questionable if any antidumping duty would be incurred within the 68-day period. Whatever products American manufacturers may be offering in Canada at sacrifice prices at the present time, raw steel does not seem to be one of them. The liability to a penalty duty is at all events small. It is doubtful if the removal of the specific duty will be of any benefit to rolling mills and forges unless in cases where purchases were made some time ago at lower prices for delivery now due. There is reason to believe that such purchases were made.

As further negativing large imports there is the recent action of the Government in abolishing the $3 bounty on rails. Having lost that contribution from the Dominion treasury, the rolling mill people will not be desirous of forfeiting also the bounty of $1.10 per ton on billets. In short, they have every motive for preferring to make their billets to importing them.

For the making of them, however, certain conditions are necessary. Blast furnaces and steel furnaces may not always be equal to the task of keeping the rolling mills fed at a time like the present, when the demand for rails is active and capacious. It may sometimes be found that more satisfactory billets can be imported than those that can be turned out at home, for the rail purchasers are to be the judges. If it should be the case that rolling mills at any point have to fall back on American or other foreign billets the imports will not of course be restricted to the limits necessary to get the benefit of the waiver of the antidumping duty. But as has been mentioned, the antidumping duty is likely to be a negligible quantity, any way, for the prices are not being sharply cut for exportation from the United States.

C. A. C. J.

Trade Publications.

A Pig Iron Almanac is the title of a handy little memorandum book which is being issued by Rogers, Brown & Co., the well-known pig iron merchants of Cincinnati. William A. Rogers, who organized the firm in 1880, gives a history of its development and its growth until now the firm is interested in, to the extent of operating them, 24 blast furnaces in various parts of the country, and sells the product, wholly or in part, of 23 more. The Almanac describes the different brands of pig iron and coke handled by the firm and gives a variety of interesting statistical tables germane to the subject. Blank pages for entering analyses and for memoranda complete the little book.

Lamps.—Nernst Lamp Company, Pittsburgh, Pa. Central Station Bulletin No. 6. Leading articles: Use of Nernst Lamps in the Middle West, 110-Volt Lamps, Fusible Plug Heater Cut-out, Composite Lamps, and The Capacity of the Nernst Lamp to Stand Overvoltage.

Electric Fans.—Crocker-Wheeler Company, Ampere, N. J. Bulletin 54, entitled, "A Few Words About Electric Fans." Shows Crocker-Wheeler ¾ L Motor direct connected to 24-inch Davidson fan, 5 I motor direct connected to 42-inch fan and 2 L vertical motor direct connected to 36-inch fan. These fans are made in sizes from 18 to 60 inches.

Electrical Machinery.—General Electric Company, Schenectady, N. Y. Bulletins, &c. Bulletin 4408 pertains to 125, 250 and 600 volt continuous current two-wire switchboard panels, with carbon break circuit breakers; bulletin 4409, to electrically driven house pumps; 4412, to electric hoists for building operations and general construction work, and 4413, to the CQ motor; flyer 2146, single pole snap switches; flyer 2151, rail bonds; flyer 2153, candelabra adapter; price-list 5136, prices of railway line material, and publication 9138, which gives a complete description, with illustrations, of an improved system of electrically operated automatic railway block signals.

Bearing Metals.—Magnolia Metal Company, 113 Bank street, New York. To advertise its bearing metals this company is distributing a 15-inch brass edged ruler, bearing printed matter calling attention to Magnolia metal, which is claimed to last longer, run cooler and require less oil than other anti-friction metals. There are four grades made, Defender, Mystic, Kosmic and Adamant, which give a wide range in quality and price.

Oil Filters and Exhaust Heads.—Burt Mfg. Company, Akron, Ohio. Catalogue. Size, 6 x 9 inches; pages, 48. Illustrates and describes the Cross, American and Warden oil filters,

the American oil filtering system and the unit type of oil filters and the Burt and Standard exhaust heads. Sectional views as well as exterior views are freely used to show the construction and principles of operation. Also contains useful information concerning the filtering of oils, making it of peculiar value to those interested in the operating of power plants. A list of prominent users is appended.

Steam Engines.—B. F. Sturtevant Company, Boston, Mass. Bulletins 78 and 76. Describe respectively vertical and horizontal center crank engines. Each type is built in about 20 sizes. The horizontal type is entirely inclosed, is provided with a watershed partition and is equipped with forced lubrication. These engines were particularly designed for the direct connected driving of electric generators.

Lathes.—Gisholt Machine Company, Madison, Wis. Loose leaf for catalogue. Pertains to the making of duplicate parts, particularly those for locomotive and electrical machinery, explaining the capacity of the Gisholt lathes for the rapid and accurate manufacture of duplicate parts.

Gasoline Motors.—Buffalo Gasolene Motor Company, 1280 Niagara street, Buffalo, N. Y. Folder. Contains reproduction in color of the 1905 pattern of the Buffalo motor, which is manufactured in a variety of sizes from 2 to 40 horse-power. It operates on the four-cycle principle. A more extended description is given in the new 1905 catalogue.

NEWS OF THE WORKS.

Iron and Steel.

The Illinois Steel Company will shortly double the equipment of machinery for shearing, punching, coping and otherwise fabricating structural and plate steel, at its North Works, Chicago. Important improvements and enlargements will also be made at its South Chicago plant.

The Empire Steel & Iron Company is relining one of its furnaces at Reading, Pa., and may start it this fall.

The Paden City Iron Company is equipping its new mill at Paden City, W. Va., and it is expected that the company will begin operations September 1.

The blast furnace of the Carnegie Steel Company at the North Works, Sharon, Pa., which was banked for a short time, has been put in blast again. The Monnell process for making steel is to be installed in the open hearth plant at this works.

No. 2 blast furnace of the Carnegie Steel Company at Youngstown, Ohio, was blown in on Sunday night, August 20, after being thoroughly repaired. All four furnaces of the Carnegie Steel Company at Youngstown are now in blast, making about 2000 tons or more of iron per day, all of which is used in the Ohio Steel Works, which are also running to full capacity.

Tod Furnace of the Youngstown Steel Company, Youngstown, Ohio, is idle at present, undergoing repairs, but will be ready for blast in a short time. The furnace makes washed metal for special purposes.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, is preparing to build a continuous billet and sheet bar mill. The United Engineering & Foundry Company is to erect the structure, and the William Tod Company, Youngstown, will build a blowing engine for the company's Bessemer plant.

General Machinery.

The Skinner Chuck Company, New Britain, Conn., is making important improvements to its shops by raising the older part of its plant from three to four stories, making the latter hight uniform throughout. Some new machinery has been purchased to install in the additional space which will be obtained. The enlargement will not only take care of the present line of goods but will afford facilities for the manufacture of new styles of chucks. Plans are being prepared for further additions in the way of new boiler house and storehouse. The Skinner Chuck Company was organized in 1887, when room and power were rented from the North & Judd Mfg. Company. In 1890 a three-story brick building 40 x 80 feet was erected, and as the company confined itself to the manufacture of chucks it was supposed that the building was as large as would be required for a long period. But in 1901 more room became necessary, and a four-story front, 40 x 80 feet, was put on the building.

The stockholders of the Spencer Automatic Machine Screw Company, Hartford, Conn., have adopted the recommendation of the Board of Directors and voted to close the business. The method of procedure has not been determined.

The Worcester Machine Screw Company, one of the constituent parts of the Standard Screw Company, is to add to its capacity by the installation of 25 new screw machines, which will be largely devoted to special work.

The General Machinery & Supply Company, Chicago, has been organized with S. E. Bliss as president; Alfred Marshall, vice-president, and H. O. Lange, secretary and treasurer. The company has purchased most of its tools and equipment and will operate a machine shop employing 35 to 40 men in the manufacture of small sizes of power and steam hammers, car wheels and axles for mining and industrial purposes, grinding machinery and sheep shearing machinery. The company is capitalized at $75,000. Mr. Bliss is president of Bliss & Laughlin, shafting manufacturers, Harvey, Ill.; Mr. Marshall, president of Marshall & Huschart Machinery Company, Chicago, and Mr. Lange secretary of the William Ferguson Foundry Company, Chicago.

The Wilkin-Challoner Company has been organized and incorporated at Oshkosh, Wis., with a capital stock of $100,000, by Theodore S. Wilkin of Milwaukee, Charles W. Radford and John Challoner of Oshkosh. The company has commenced the erection of a building, all equipment for which has been placed, and will build a full line of sawmill machinery, such as steam gangs, steam set works, gang edgers, steam neggers and the like. The machines were designed by Mr. Wilkin and have been on the market a number of years, having been made heretofore in other shops.

The Burtt Mfg. Company, maker of automobiles, gasoline engines and tire setters, Kalamazoo, Mich., is about to build a new factory building, 66 x 177 feet, which will provide larger quarters. Very little new equipment will be required at present.

The Dutton-Lounsbery-Kievit Company, Kalamazoo, Mich., which was organized a short time ago for the manufacture of boilers, engines, stacks, tanks and other similar products, has had its business grow to such an extent that a large factory has been secured to meet its needs. The company has purchased the old Kalamazoo Electric Company's plant and will remodel it, installing the latest improved electric machinery for general boiler work. Officers of the company are as follows: George Dutton, president; K. C. Kievit, vice-president, and Ward Lounsbery, secretary and treasurer.

The Buffalo Concrete Mixer Company, Buffalo, N. Y., has been formed by the Goold, Shapley & Muir Company, Brantford, Canada, in order to push the manufacture and sale in the United States of cement-concrete mixers made by the Goold, Shapley & Muir Company. These machines will be manufactured in an existing plant in Buffalo and the company does not anticipate the building of new works at the present time. The officers of the Buffalo Concrete Mixer Company are: President, John Muir; vice-president, E. L. Goold; manager, W. J. Knowles; secretary-treasurer, W. B. Whitaker. Mr. Knowles resides in Buffalo and the other officers of the company are located at Brantford.

The Robins Conveying Belt Company, New York, has the contract for installing coal conveyors and elevators for the Haverhill Electric Company, Haverhill, Massachusetts, as well as the contract for the coal handling machinery for the boiler house of the Arlington Mills Company, Lawrence, Mass., and an order for belt conveyors for the New Jersey Zinc Company's plant at Palmerton. The Robins Company is also about to complete several large export shipments for Germany and South Africa.

Foundries.

The Stevenson Company, which operates the Fulton Foundry & Machine Works, Wellsville, Ohio, has nearly completed its new buildings, which comprise a machine shop, 58 x 132 feet, and a foundry, 60 x 120 feet. Two 10-ton electric traveling cranes have been installed, together with electric generator for power and light. Motors are provided for each machine. The American Bridge Company is erecting the buildings.

The Nordyke & Marmon Company, Indianapolis, Ind., is constructing a new foundry to be operated in connection with its plant. The building which is nearing completion is 104 x 340 feet in size and materials used are steel and brick, and the roof is full mill construction. The side bays are about 25 feet high and the middle bay is about 40 feet high. While the structure is designed for foundry purposes, it will be used for other purposes for a short time. The equipment for the structure has been purchased and is on the ground.

The Lebanon Stove Company has been granted a charter to operate stove works at Lebanon, Pa.

The Reading Foundry Company's plant at Reading, Pa., has been sold at sheriff's sale for the benefit of the bondholders to Charles H. Schaeffer of Reading. The price was $27,500 and the plant may be started again. It consists of about 10 acres of land, pipe and general foundries, machine shop and engine and boiler plant.

The General Electric Company, Schenectady, N. Y., which has been having considerable of its work done in the Cohoes Iron Foundry and other places, proposes to erect a plant to do all of its own work.

Power Plant Equipment.

The W. N. Best Calorific Company has been organized to manufacture hydrocarbon burners for the consumption of liquid fuel. The company will also make the various equipments in marine, locomotive and stationary works, as well as various types and capacities of furnaces. The principal office of the company is located at 11 Broadway, New York, and the officers are: President, E. Childs; vice-president and secretary, W. A. Forman; treasurer and general manager, H. R. Green, and mechanical and consulting engineer, W. N. Best.

The Bond Foundry & Machine Company, Manheim, Pa., has been organized to manufacture power transmitting machinery, making a specialty of hangers and shafting. It is stated that the company will not be in the market for any machinery just now, but later on will make some purchases. The officers are:

President, Charles Bond; vice-president, Joseph Burr; treasurer, Henry Beamsderfer; secretary, H. H. Schenck.

The Toledo Boiler Works, Toledo, Ohio, for years owned personally by D. D. Flanner, has been transferred to a stock company organized by Mr. Flanner known as the Toledo Boiler Works Company, capitalized at $100,000. The plant is at present closed for inventory and will be opened by the new management September 1. Business has been increasing to such an extent that considerable enlargements will have to be made. The following are interested in the new company as incorporators: D. D. Flanner, A. M. Chesbrough, W. F. Day, E. W. Newton and J. H. Wagenhorst.

The Central Pennsylvania Traction Company, Harrisburg, Pa., has determined to build a power plant to cost from $225,000 to $250,000 for the purpose of increasing the capacity of its lines. The Board of Directors has named a committee to take charge of the negotiations and to construct the plant. High units will be installed.

Bridges.

The County Commissioners of Montgomery County, Pa., have awarded the contract for the new steel bridge over Zacharias Creek to the Eyre Construction Company, Philadelphia, for $3350.

The State of Pennsylvania will ask bids for construction of two new State bridges this fall. The plans are now being prepared.

Fires.

Fire destroyed the plant of the Newcastle Forge & Bolt Company, Newcastle, Pa., on August 20, causing an estimated damage of $100,000.

The plant of the Charles Holmes Machine Company at East Boston, Mass., was visited by fire last Saturday. The loss is estimated at $30,000.

Hardware.

The Coonley Mfg. Company, Clyde, Ill., manufacturer of enameled cooking utensils, is enlarging its plant by the erection of an addition, 50 x 50 feet, to its pressroom. Two new furnaces are also to be built. The company has been operating a little more than a year and to provide for the increased demand for its products these additions have become necessary. The officers are: Howard Coonley, president and treasurer; J. S. Coonley, vice-president; P. L. Coonley, secretary, and A. L. Jones, manager.

The Bissell Carpet Sweeper Company, Grand Rapids, Mich., contemplates quite a large addition to its factory, though plans are not as yet entirely completed. One four-story brick structure has been determined upon for general factory purposes and for the accommodation of large offices.

The Wheeling Roofing & Cornice Company has issued $100,000 in bonds to be used in making enlargements and improvements to its plant at Wheeling, W. Va.

The Winchester Repeating Arms Company, New Haven, Conn., is to erect a new building, 40 x 100 feet, to be used as a stock drying room.

The Berkshire Specialty Company, Pittsfield, Mass., has been organized under Massachusetts laws to manufacture various specialties, including a safety check loop for harness. The company will establish no factory, the work being done for it by outside parties.

Sargent & Co., New Haven, Conn., have made a large addition to their manufacturing property by the purchase of nearly the whole of a block next east of one of the firm's other blocks, from which it is separated by East street. There is already a large brick factory building on the newly acquired land, in the form of an ell, the main building running from East street through the block and the other, a new part, fronting 80 feet on East street. No machinery has yet been placed. The buildings are all four stories in hight and will be occupied as soon as possible. This purchase has no connection with the large factory building now under construction by the firm, and already noted.

The Lockwood Mfg. Company, South Norwalk, Conn., manufacturer of builders' hardware, is to erect a building 35 x 55 feet, and four stories, for the purpose of procuring more room for the warehouse, packing and shipping departments, and pattern and tool room. The improvements are not intended for an increase of business, but to afford better facilities for the more economical handling of the present output.

The Nettleton Mfg. Company, Middletown, Conn., has been organized under Connecticut laws with a capital stock of $5000, to manufacture hardware specialties, including the Nettleton Reversible Nipper. The factory is located at Middletown. The incorporators are Joseph N. Nettleton and Frederick S. Bacon, Middletown, and John T. Nettleton, New Haven.

Miscellaneous.

The Dickason Construction Company has organized at Chicago with a capital stock of $25,000 to do a general construction and contracting business. The following are the incorporators: L. T. Dickason, president of the Westville Coal Company; Fred. Davidson, and Arthur S. Kent, assistant engineer of the Chicago, Indianapolis & Louisville Railway.

The Galena Iron Works Company, Galena, Ill., is building for the Skene Lead Company, Elizabeth, Ill., a complete concentrating and electric power plant, the equipment for which includes two 14-inch pumps, one 100-kw. generator, one four-valve Atlas engine, four 100 horse-power boilers, four electric hoists, and three motors.

The Jones Brothers Coal & Mining Company, Marissa, Ill., is successor to the Eureka Coal Company. The incorporators are Jonathan Jones, Sr., and William and Charles Jones.

Pennsyl Mfg. Company, Chicago, has incorporated to manufacture electrical appliances. Foree Bain, 947 Monadnock Block, George T. May, Jr., and M. F. Allen are the incorporators.

The Fuel Saving Machinery Company, Chicago, is a new company organized with a capital stock of $15,000 to build and sell fuel saving machines manufactured under the Geo. S. Welles patents. The president of the company is Mr. Welles, and the secretary and treasurer W. M. Emmons. Offices are located at 161 East Randolph street.

The Neely Knife & Saw Company, Anderson, Ind., has planned an increase in the capacity of its factory, but arrangements have not progressed sufficiently to give details.

The Standard Brass Works, Detroit, Mich., has had plans prepared for adding a third story to its factory, 29 x 90 feet.

Green River Peat Fuel Company, Manlius, Ill., has incorporated with a capital stock of $125,000. Edward W. Peterson, Lot E. Anderson and Max P. Seibel are the incorporators.

The Chicago Drop Forge & Foundry Company, Kensington, Ill., manufacturer of drop forgings, is installing several heavy presses and hammers for the manufacture of heavy drop forgings. The demand for drop forgings of large size is constantly increasing, and it is to meet these changed conditions that these large machines are being installed. The plant operated by this company was one of the first to manufacture drop forgings west of the Allegheny Mountains. It was estab'ished in 1881.

The newspaper report to the effect that the Cincinnati, Hamilton & Dayton Railway Company proposed to move its Père Marquette Railway shops from Muskegon, Mich., has been officially denied.

The Middletown Car Works, Middletown, Pa., has taken an order for 150 cars with the King patent underframe for the Nipe Bay Company of Cuba. The company is building cars for Japan, Panama, Argentina and Peru as well as handling domestic business.

The Helmschmied Mfg. Company, art glass manufacturers, Meriden, Conn., has increased its capital stock from $10,000 to $25,000. The company proposes to build a new factory shortly, but has not decided as yet where it is to be located. It is stated by the officers of the concern that considerable machinery will be needed as soon as plans are completed for the erection of the proposed plant.

The City Forge & Iron Works, Dayton, Ohio, Andrew Plocher, proprietor, is erecting an addition to its forge shop 50 x 50 feet in size. The enterprise was established in 1895 in a room 30 x 30 feet, and has grown rapidly since its inception.

The Pressed Steel Pole Company, Pittsburgh, Pa., has been organized and a location is being sought for its proposed plant. It has been announced that the industry will locate in a city or town that will buy some stock and assist the company to get started. At present the Pressed Steel Car Company, Pittsburgh, does its manufacturing. It is claimed that pressed steel poles can be made and sold for less than wooden poles designed to answer the same service.

The Hillyer Heating & Ventilating Company is negotiating for the removal of its plant from Freeport, Ohio, to Scio, Ohio, the consideration being a free site and a cash bonus.

Eugene E. Nice, manufacturer of paints, Philadelphia, Pa., has closed a contract with H. C. Dahl, builder, of the same city, to erect a new warehouse at 203-207 Spruce street. The warehouse is to be 50 x 60 feet, of the slow burning type of construction, of brick, four stories high. The addition will be used for the packing, labeling and storage of manufactured goods. An electric elevator will be installed, but no machinery for manufacturing purposes will be required.

The Morse Iron Works, Erie, Pa., is having erected there a plant which is expected will be in operation in a very short time. The buildings will consist of main structure, 100 x 192 feet in size, to be used for a molding room, and another structure, 100 x 120 feet, to be utilized for a machine shop. Both buildings will be one story in hight. The Bellefontaine Bridge & Iron Company, Bellefontaine, Ohio, has the contract for erecting the buildings, and all the contracts for machinery have been placed. The officers of the Morse Iron Works are: William Hamilton, president; Thomas G. Morse, vice-president; Arthur Brevillier, secretary; George Schaal, treasurer.

The Jay Street Terminal Company, 71 Water street, New York, has awarded a contract to the Terry & Tench Company to construct a warehouse at the foot of Jay street, Brooklyn. The building will be 127 x 150 feet in size and seven stories high. Electrical elevators will be installed, and it is stated that no other machinery will be required. Arbuckle Bros., Brooklyn, are having prepared plans for a new plant to cover the site surrounded by John, Jay and Plymouth streets. The structure will be used for warehouse purposes, and will be 100 x 190 feet in size.

The Iron and Metal Trades

To put it mildly quiet confidence in the future reigns throughout the Iron industry, while some of its great captains foretell, with expressions of regret, the coming of a boom this fall.

The trade is on the tiptoe of expectation over the purchases of Pig Iron which the Steel Corporation is to make. We understand that it will not be done for the next week or ten days in any case. The officers of the corporation have ordered every modern furnace into blast, so that only Niles, Zanesville and Columbus will be idle. With all these furnaces in operation, and drawing stocks down to the lowest limit, there will be a shortage below requirements of 35,000 tons for September.

While the general trade is buying Pig Iron on a conservative scale, the consumption is evidently excellent since requests for quick shipments are frequent and urgent. Among the larger purchases during the past week are an aggregate of 10,000 tons of Foundry Iron for the first quarter of next year by a large mining machinery plant in Milwaukee and a lot of 8000 tons of Malleable Pig for St. Louis. A leading Steel foundry interest has purchased quite a tonnage of Basic Pig and of Low Phosphorus Pig, the demand for the latter having been quite active lately.

In addition to the 75,000 tons of Steel Rails taken by the Harriman roads during the last week, 25,000 tons more have been purchased, of which 15,000 tons went to an Eastern mill which can reach the Gulf by water. Some of the large systems tributary to Chicago, notably the St. Paul and the Rock Island, have been in the market in vain for large blocks of Rails for this year's delivery. The St. Paul succeeded in placing 3000 tons and the Great Northern 5000 tons.

Eastern Plate and Structural mills are marketing quite a tonnage in the Chicago district. Thus a Coatesville mill took a lot of 6000 tons of Plates in Chicago and delivered the order within a week.

From Cleveland comes the report that three new ships have been contracted for and that seven more vessels are virtually placed.

The Wire trade continues to witness a heavy movement. Some of the Sheet makers report a heavy increase in business, but others still complain that there has been little improvement. The relatively low prices on Merchant Pipe have caused a perceptible increase in the demand, and even in Tin Plate business is stirring.

In the Metal trade the principal item of interest is that 16 cents has been reached for Lake Copper for early delivery, that price having been made on the merits of the situation alone.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Aug.23, 1905.	Aug.17, 1905.	July26, 1905.	Aug.24, 1904.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	$16.25	$16.25	$16.25	$14.25
Foundry Pig No. 2, Southern, Cincinnati	14.50	14.50	14.50	12.00
Foundry Pig No. 2, Local, Chicago	16.25	16.25	16.25	13.25
Bessemer Pig, Pittsburgh	**15.35**	15.10	14.85	12.70
Gray Forge, Pittsburgh	*14.60*	14.40	14.50	11.85
Lake Superior Charcoal, Chicago	16.50	17.00	16.50	15.00
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	**24.00**	24.00	23.00	21.00
Steel Forging Billets, Pittsburgh	**26.00**	26.00	25.00	....
Steel Billets, Philadelphia	**27.00**	26.50	26.50	24.00
Steel Billets, Chicago	**29.00**	28.00	28.00	22.00
Wire Rods, Pittsburgh	32.00	32.50	32.00	28.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	**14.50**	14.00	14.00	11.00
O. Steel Rails, Philadelphia	16.00	16.00	16.00	11.75
O. Iron Rails, Chicago	**20.00**	19.00	18.75	15.75
O. Iron Rails, Philadelphia	**20.50**	20.00	18.50	15.00
O. Car Wheels, Chicago	**15.00**	14.75	14.75	11.00
O. Car Wheels, Philadelphia	**15.50**	15.00	14.50	12.00
Heavy Steel Scrap, Pittsburgh	**15.00**	15.00	14.25	11.50
Heavy Steel Scrap, Chicago	*13.00*	13.00	13.50	9.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.48½
Common Iron Bars, Chicago	**1.60**	1.55	1.50	1.35
Common Iron Bars, Pittsburgh	**1.60**	1.60	1.55	1.30
Steel Bars, Tidewater	1.64½	1.64½	1.64½	1.49½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.35
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.74½	1.74½	1.74½	1.74½
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.74½	1.74½	1.74½	1.74½
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Steel, Pittsburgh	1.50	1.50	1.50	1.32½
Skelp, Sheared Steel, Pittsburgh	1.55	1.55	1.55	1.35
Sheets, No. 27, Pittsburgh	2.20	2.20	2.20	2.00
Barb Wire, f.o.b. Pittsburgh	2.25	2.25	2.25	2.05
Wire Nails, f.o.b. Pittsburgh	1.80	1.80	1.80	1.60
Cut Nails, Mill	*1.60*	1.65	1.80	1.65
METALS:				
Copper, New York	**16.00**	16.00	15.12½	13.50
Spelter, St. Louis	**5.65**	5.65	5.40	4.72½
Lead, New York	4.60	4.60	4.60	4.10
Lead, St. Louis	4.50	4.60	4.50	4.00
Tin, New York	**33.15**	32.62½	32.90	26.85
Antimony, Hallett, New York	**15.00**	14.50	13.50	7.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.74	3.74	3.74	3.49

Chicago.

FISHER BUILDING, August 23, 1905.—(*By Telegraph.*)

The most important transaction of the local markets has been the sale of an aggregate of nearly 125,000 tons of Standard Section Steel Rails by the several interests represented here to Western roads. These Rails were nearly all sold for December delivery, which in the nature of the case means that the bulk of the tonnage will be delivered during the early months of next year. Of the total tonnage 85,000 tons went to the Harriman roads. The demand for Rails is heavy, and the opening of the books of the mills for the next year will be the signal for the placing of large tonnages. Light Rails, too, are in good demand, and there is a marked shortage of 8 and 10 lb. weights. Even the heavier weights ranging from 12 lbs. up, are procurable only after two and three months' delay, as mills are far behind their orders. Prices on Light Rails are likely to advance. In Pig Iron the Allis-Chalmers Company bought 10,000 tons for delivery the first quarter of next year at its Milwaukee, Chicago and Scranton plants, the tonnage being divided between Northern and Southern Irons. Other melters in this district bought round tonnages, and the week has been an active one as far as actual booking of business is concerned. Prices, too, are well maintained on the same basis as was quoted last week in this report, except that Ohio Irons are higher and Lake Superior Irons lower. Scarcity in Billets is becoming more pronounced and buyers are freely offering premiums for prompt delivery, as high as $35 a ton, Chicago, being paid for Forging Billets in car lots. Sheet Bars and Wire Rods are equally strong. The congested condition of the Structural Steel market is somewhat relieved by the Eastern Steel Company, which has recently entered the market after enlarging its plant. This producer is able to com-

mand a premium above current prices for prompt delivery. The Plate situation would be a most uncomfortable one to buyers were it not for tonnages offered by the two large southeastern Pennsylvania mills, whose producing capacity is sufficient to meet all requirements up to date and to make deliveries within a week to ten days of receipt of order. The undercurrent of strength in the Sheet market that has been noted for the past two weeks is becoming somewhat more pronounced, and there is surface evidence that an extremely large tonnage is being booked quietly not only by the leading producer but by independents. When the mills shall have reached a position where their normal tonnages are assured there is every prospect of an advance in prices above the present low basis. Bar Iron is strong, with 1.60c., base, Chicago, easily the minimum, and with buyers paying 1.65c. for fourth quarter delivery. Bar Steel is unchanged in price and a good business is being done. The same is true of Merchant Steel commodities. Pipe continues to be weak, but mills are holding down tonnages which they will accept at present figures and are limiting dates of delivery. Boiler Tubes are unabated in strength. The Cast Iron Pipe market is without incident, but a good routine business is being booked. Old Iron and Steel are somewhat higher owing to the continued support given by dealers, it still being a dealer's market, with the large consumers holding off for the present at least. Coke rules somewhat higher, with actual advances made on some of the lower grades.

Pig Iron.—The week under review has been characterized by heavy volume of trade, consisting mainly of round lots bought by five or six interests in the West, including 10,000 tons of Northern Foundry, Southern Foundry and Southern Silvery bought by the Allis-Chalmers Company for delivery the first quarter of 1906, and lots of from 1000 to 3000 tons each by a number of Malleable and Foundry interests in Chicago and Milwaukee. Lake Superior Charcoal is weaker because of the accumulated stocks at the furnaces and the desire to get stocks down as low as possible before the close of navigation. The strengthening in the prices of Ohio Irons has helped the whole tone of both Northern and Southern products, although we record no advances in prices except on Ohio Irons delivered at Chicago. Furnace operators as a rule seem to be willing to accept the present maximum prices for business for the first quarter of next year, and concessions below this basis have been offered on contracts extending to next July. The Southern furnaces are offering for sale some Iron for August and September delivery on the basis of $11.75, and asking $12 for fourth quarter. Prices, Chicago delivery, are as follows:

Lake Superior Charcoal	$16.50 to $17.00
Northern Coke Foundry, No. 1	16.75 to 17.00
Northern Coke Foundry, No. 2	16.25 to 16.50
Northern Coke Foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.25 to 17.50
Ohio Strong Softeners, No. 1	17.05 to 17.30
Ohio Strong Softeners, No. 2	16.55 to 16.80
Southern Silvery, 4 to 6 per cent. Silicon	16.65 to 17.65
Southern Coke, No. 1	15.90 to 16.15
Southern Coke, No. 2	15.40 to 15.65
Southern Coke, No. 3	14.65 to 15.15
Southern Coke, No. 4	14.40 to 14.90
Southern Coke, No. 1 Soft	15.90 to 16.15
Southern Coke, No. 2 Soft	15.40 to 15.65
Southern Gray Forge	14.15 to 14.65
Southern Mottled and White	13.90 to 14.40
Malleable Bessemer	16.50 to 16.75
Standard Bessemer	13.55 to 13.80
Jackson Co. and Ky. Silvery, 6 to 8 % Silicon	17.70
Jackson Co. and Ky. Silvery, 7 to 9 % Silicon	19.30
Jackson Co. and Ky. Silvery, 8 to 10 % Silicon	20.30
Alabama Basic	13.65

Billets.—Forging Billets cannot be obtained in this market at less than $30, base, and the price ranges from there up to $35, according to promptness of delivery; even at these prices delivery is anything but prompt.

Rails and Track Supplies.—Nearly 125,000 tons of Standard Section Rails were sold in this market during the week under review. While these orders were nominally booked for 1905 shipment, it is easily understood that the condition of Rail mills in both Pittsburgh and Chicago territory is such as to make a large portion of this tonnage go over to next year. The Rail interests have not yet opened their books for 1906, but are booking freely for December delivery this year, which means the same thing. In Light Rails premiums of from $1 to $2 are paid for prompt delivery on sizes down to and including 12 lb., while 8-lb. Rails command a still greater premium, the prices ranging from $30 to $36, f.o.b. Pittsburgh, and from $33 to $38, Chicago, according to size and desirability of the order. We quote: Standard Sections, $28, f.o.b. mill, in 500-ton lots or greater; Light Sections, down to 12-lb., $25 to $28, f.o.b. mill; 10-lb., $30; 8-lb, $33. Angle Bars are unchanged at 1.40c. to 1.50c. Spikes are stronger at 1.75c. to 1.80c. Track Bolts are quoted at 2.40c. to 2.50c., base, Square Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Material.—The Eastern Pennsylvania mill that has recently entered the market is booking large tonnage here at 10c. to 15c. premium above official prices for prompt delivery. No buildings of any consequence have been awarded during the week, but the tonnage of Structural Steel being shipped on orders to jobbers and contractors and car builders is extremely heavy. Official prices for delivery from mill, f.o.b. Chicago, in car lots, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work. Store prices on Angles, Beams and Channels range from 2c. to 3c., according to quantity on hand in store or obtainable from mill.

Plates.—The two large Coatesville, Pa., mills are still making very prompt shipments of Plates into this territory, one order for 6000 tons having been executed and shipped within a week after receipt of the order. The Lackawanna Company is also able to ship in three to four weeks from receipt of order. Jobbers are doing a heavy business from store. We quote: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Sheared and Universal Mill Plates, Tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—A very heavy buying movement is going on quietly, mainly in the shape of contracts for delivery as far into the future as mills will obligate themselves to go. Sheet producers are assuming the attitude of taking care of their customers against competition, but not of soliciting business actively at present low prices, whatever pressure is in evidence coming from the buyers instead of the sellers. The market is in a condition where an advance in prices is not an impossibility on both Black and Galvanized. We quote: Blue Annealed, Nos. 9 and 10, 1.81½c. to 1.86½c.; Box Annealed, Nos. 18 and 20, 2.16½c. to 2.21½c.; No. 27, 2.31½c. to 2.36½c.; No. 28, 2.41½c. to 2.46½c., with the customary differentials between gauges. Store prices are based on a minimum of 2.10c. for No. 10 Blue Annealed, 2.50c. for Nos. 18 and 20 Box Annealed, 2.65c. for No. 27 Box Annealed and 2.75c. for No. 28 Box Annealed. Galvanized Sheets are quoted in car lots from mill at about the following prices, some mills asking a little more and some offering at $1 a ton less; No. 10, 2.41½c. to 2.46½c.; Nos. 17 to 21, 2.81½c. to 2.86½c.; No. 27, 3.26½c. to 3.31½c.; No. 28, 3.46½c. to 3.56½c. Store prices on Galvanized Sheets are as follows: Nos. 10, 12 and 14 are selling at from 3c. to 3.10c., Nos. 22 and 24 at from 3.05c. to 3.15c., No. 27 at from 3.50c. to 3.65c. and No. 28 at from 3.70c. to 3.95c., with intermediate gauges in proportion and with customary differentials for widths and lengths.

Bars.—The mill at Ft. Wayne is temporarily out of the market owing to reorganization of its affairs, but is expected to start up by September 12. Bar Iron makers are quoting 1.60c. for immediate specifications and 1.65c. for contracts for the balance of 1905. Heavy tonnages are being booked on Steel Bars, notably by the implement and vehicle manufacturers, while the car building interests are consuming immense quantities of Iron Bars. We quote Iron Bars, 1.60c. to 1.65c.; Steel Bars, 1.66½c., both half extras; Hoops, 1.81½c. rates, full extras; Soft Steel Angles and Shapes, 1.76½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—A large tonnage has been booked for deliveries ranging up to next July and prices have been well maintained. Current prices for delivery of straight lots not covered by contract are as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—There is no change in the situation since last week and producers are all disposed to limit sales at present low prices to relatively small tonnages and to

nearby deliveries. Current discounts to consumers from mill range from 77.35 per cent. to 77.85 per cent. on base sizes of Black Steel, ¾ to 6 inches, and jobbers are buying their Pipe at the usual reductions below prices to consumers. Galvanized Pipe still maintains its ten points premium over Black and Iron Pipe three points over Steel. Prices from Chicago stores average 76 per cent. discount on Black Steel for small lots, with concessions on round lots, and the usual differentials for the Galvanized and for Iron.

Boiler Tubes.—The market is strong and prices are well maintained. The following are official discounts, f.o.b. Chicago, in car lots: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.85. Store prices are nominally unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—The following prices represent figures that will be quoted in car lots and greater, large tonnages, of course, securing lower prices: Water Pipe, 4-inch, $29; 6, 8 and 10 inch, $28; 12-inch and larger, $27, per net ton, with $1 extra charged for Gas Pipe. Large tonnages bought by municipalities on a competitive basis bring out considerably lower prices.

Coke.—The Coke market is strong, with an upward tendency. Car shortage is beginning to be a factor in the trade, but locally the supply of by-product Coke immediately accessible is being counted on to relieve any discomfort in this direction. Connellsville Foundry Coke and Milwaukee Solvay are both held at $5.15, Chicago, and Wise County operations are strong at $2.50, ovens, on Foundry quality, or $4.75, Chicago.

Old Materials.—Dealers continue to buy the bulk of tonnages offered by railroads and other producers of Scrap, and prices are advancing steadily under the impetus of the competition among dealers for materials offered, some of the quotations given below being $1 higher than those of a week ago. Large consumers of Scrap still refuse to come in as buyers, but there is a little more nervousness evinced on the part of buyers as to the result of the dealers' efforts than there has been heretofore. Some astonishingly high prices are paid by consumers, and some by dealers for isolated lots offered by railroads, but in our report recognition is always made that such exceptional cases do not make a market. The most astonishing feature of the market is the high price that is paid for Cast Scrap, sales having been made in Chicago within the week at $14 a net ton, which is equivalent to $15.68 a gross ton, or 28c. higher than the price of No. 2 Pig Iron. The Chicago, Milwaukee & St. Paul road sold a fairly large tonnage of Scrap since last report, receiving higher prices than have been paid to railroads for a good many months hitherto. The Chicago, Burlington & Quincy will offer about 3500 tons on August 24. The following quotations represent the range of prices paid by large consumers from producers and dealers in car lots and greater, f.o.b. Chicago:

Old Iron Rails	$20.00 to $20.50
Old Steel Rails, 4 feet and over	14.50 to 15.00
Old Steel Rails, less than 4 feet	14.50 to 15.00
Heavy Relaying Rails, subject to inspection	23.50 to 24.00
Heavy Relaying Rails, for side tracks	19.50 to 20.00
Old Car Wheels	15.00 to 15.50
Heavy Melting Steel Scrap	13.00 to 13.50
Frogs, Switches and Guards	13.00 to 13.50
Mixed Steel	11.50 to 12.00

The following quotations are per net ton:

Iron Fish Plates	$17.00 to $17.50
Iron Car Axles	22.50 to 23.00
Steel Car Axles	17.00 to 17.25
No. 1 Railroad Wrought	15.75 to 16.00
No. 2 Railroad Wrought	14.75 to 15.00
Locomotive Tires, smooth	14.25 to 14.50
Railway Springs	13.00 to 13.50
Shafting	15.00 to 15.50
No. 1 Dealers' Forge	12.00 to 12.50
Wrought Pipes and Flues	11.25 to 11.50
No. 1 Cut Busheling	11.25 to 11.50
Iron Axle Turnings	10.50 to 11.00
Soft Steel Axle Turnings	10.25 to 10.50
Machine Shop Turnings	10.00 to 10.50
Cast Borings	8.50 to 8.75
Mixed Borings, &c	8.25 to 8.50
No. 1 Mill	9.25 to 9.50
Country Sheet	8.25 to 8.50
No. 1 Boilers, cut to Sheets and Rings	10.50 to 11.00
No. 1 Cast Scrap	13.50 to 14.00
Stove Plate and Light Cast Scrap	11.00 to 11.50
Railroad Malleable	13.25 to 13.50
Agricultural Malleable	12.55 to 13.00

Metals.—Prices are unchanged since last week and a good volume of business is being transacted. We quote: Casting Copper, in car lots, 16c. to 16⅛c.; Lake, 16⅛c. to 16¼c.; less than car lots ⅛c. to ¾c. higher. Pig Tin, car lots, 35c. to 35½c.; smaller lots, 36c. to 36¼c. Spelter is held at 5¾c. for car lots and 6c. to 6¼c. for small lots. Lead is 4.65c. for 50-ton lots, 4.70c. for car lots and 5.20c. to 5.30c. for small lots. Sheet Zinc is $7 for car lots, with smaller lots running from $7.25 to $7.50 per 100 lbs. The higher range of prices on new metals is reflected in sharp advances in Scrap Metals, the following being the Chicago selling prices in round lots: Copper Wire, 14c.; Heavy Copper, 13½c.; Copper Bottoms, 12½c.; Copper Clips, 13½c.; Red Brass, 12½c.; Red Brass Borings, 10¾c.; Yellow Brass, Heavy, 9¼c.; Yellow Brass Borings, 8c.; Light Brass, 7¼c.; Lead Pipe, 4¼c.; Tea Lead, 4c.; Zinc, 4¼c.; Pewter, No. 1, 21c.; Block Tin Pipe, 29c.

Cleveland.

CLEVELAND, OHIO, August 22, 1905.

Iron Ore.—The movement of Ore away from Lake Erie docks is so rapid that accumulations on the docks are reduced to the minimum, largely owing to the fact that the docks are already seriously congested with Ore and any hesitancy in the direct movement to the furnaces would result in a checking of the speed of movement down the lakes. There is a little buying of ore in small lots. Prices are firm at $3.75 for Old Range Bessemer, f.o.b. Lake Erie docks; $3.50 for Mesaba Bessemer, $3.25 for Old Range non-Bessemer and $3 for Mesaba non-Bessemer.

Pig Iron.—Many of the furnaces producing Foundry Iron are so well sold up that they are in an independent attitude regarding prices for the next three months. Others are not quite in such a strong position, but all are comfortably filled. In the week some orders have been taken on the basis of $14.25 in the Valley for No. 2, although at the present time there is very little Iron for sale for less than $14.50 for No. 2 for delivery through the latter part of the year. Most of the buyers have satisfied their needs for the time being. Southern Iron is offered in this territory at $11.75, Birmingham, for No. 2, and $11.50 could be done on a good order. Buying by the Steel Corporation is expected about the first of September. No inquiry has come in so far. It seems for the present as if most of the cheap Iron were off the market. Some sales were made in the last of the week at $14.25 in the Valley for both Bessemer and Basic. Some Basic has been sold at $14.50 in the alley. The furnaces are not anticipating any advance in the near future. The Coke trade is a little stronger, with the best grades of 72-hour Foundry Coke selling at $2.50 at the oven and other Cokes at $2.35. The best grades of Furnace Coke are bringing $2 at the oven.

Finished Iron and Steel.—The American Shipbuilding Company made contracts last week for the delivery of three new vessels by the opening of navigation next year. It is understood that seven more ship orders have virtually been placed on the lakes and that contracts will be awarded by September 1. It is understood from reliable quarters that all of the Steel for these ships has been covered in previous contracts and that they will not bring new tonnage to the books of the mills. The larger Structural mills are not in position to take on any new tonnage inside the next eight months. This is causing some distress among the smaller consumers who have not covered their needs by contract. Overflow business is going to the smaller mills, particularly those of the East and to the jobbers, who are selling material as rapidly as it is shipped to them on their contracts with the mills. Premiums range from $5 to $7 a ton. There is considerable demand for Steel Billets. Some of the large mills are in the market for about 50,000 tons. This has strengthened the market to such an extent that it has gone to $26, Pittsburgh, for Bessemer, 4 x 4s, with the usual differential on Forging Billets. The demand is unusually strong and the Steel is scarce. In this territory the call for Standard Rails is limited to the needs of some of the smaller traction lines which have strips of road under construction. Inquiries are in for about 7000 tons, with others pending which will increase the tonnage to about 10,000. It is not expected that this will be closed before September 1. The demand in other quarters, however, is so strong that prices are stiffening here, with premiums asked in some cases from $1 to $3 a ton. Most of the heavier buyers of Bars have covered their needs for the ensuing year. The Agricultural Implement people are all in, but some of the smaller consumers are just now buying in lots of 500 to 1000 tons. Bar Iron is also strong, with the mills turning down some orders based on the old price of 1.50c. The market is now 1.60c. at mill, with many of the mills tied up until the first of next year. Bar Iron is selling at 1.75c. out of stock. Sheets are still sold about $4 under the official price for prompt shipment, but prices out of stock hold firm at 2.15c. for No. 10 Blue Annealed; 2.65c. for No. 28, One Pass Cold Rolled and 3.65c. for No. 28 Galvanized.

Old Material.—Dealers are buying pretty heavily, but the mills still hold off. The good Bar business is giving hope to the dealers. The following represent dealers' quotations, gross tons: Old Steel Rails, $15; Old Iron Rails, $20 to $21; Old Car Wheels, $15 to $15.50; Heavy Melting Steel, $15. Net tons: Cast Borings, $7.50 to $8; No. 1 Busheling, $13 to $13.50; No. 1 Railroad Wrought, $15.50 to $16; Iron Car Axles, $21 to $22; No. 1 Cast, $13 to $13.50; Stove Plate, $10; Iron and Steel Turnings and Drillings, $10 to $10.50.

Philadelphia.

REAL ESTATE TRUST CO. BUILDING, August 22, 1905.

The Iron and Steel markets have made no perceptibie change during the past week or two. There is enough doing to prevent disappointment, but not enough to cause enthusiasm. The situation is regarded as strong and likely to develop improvement, but that is about all that can be said. It is gratifying, however, that no evidence of weakness can be discovered, consequently the feeling is one of quiet satisfaction and a disposition to move with the tide. Consumption continues to be on a large scale as shown by the request for quick shipments, and in some cases a portion of the Iron sold for the last quarter has been asked for during August and September when makers could so arrange it. This applies more particularly to Basic Iron, while in some cases the sellers were glad to have an opportunity of postponing their deliveries, as they were hard pressed to keep up with their contracts. This shows extremely healthy conditions, and has done much to relieve those who had Iron for prompt shipment, as well as for those who were falling behind and who were likely to be still further behind unless relieved by some such arrangement as above mentioned. Foundry grades are also in scant supply, and while there is no absolute scarcity, makers are carrying very little good Iron. Low grades are quite plentiful, however, and while there is no unusual pressure to sell, it is constantly in evidence that on the right kind of bids the Iron is for sale at low prices. The finishing end of the business is not what may be called buoyant. There is a great deal of work going on, and there is every reason to expect more as the season advances, but the mills could do more work if they had specifications in hand. The tonnage is no doubt larger than it has ever been, but the mill capacity is so great that it more than keeps pace with the increased consumption, so that additional business within the next few weeks for the Plate, Bar and Sheet mills is rather anxiously desired. On the whole, however, prospects are excellent, and it is believed to be only a question of time when everything will be running to full capacity.

Pig Iron.—The market seems to be a trifle better, sales having been larger, while inquiries for new lots are quite important. Prices have also rather a strong tone, although they are no higher than they were a week ago, the bulk of the sales of No. 2 X Foundry having been at $16.25 to $16.50, according to quantity, delivery and brand. Mill Irons are extremely dull and prices too irregular to be quoted with exactness. The best brands of Gray Forge are held at comparatively high figures, say $15 to $15.25, while ordinary brands may be had at almost anything from $14 to $14.50. Basic Irons are stronger, and although recent sales have been made at about $15, delivered, others since then have been made at $15.50, and in at least one instance more than $15.50 was paid for a special brand, and at this writing $15.50 would be an inside figure. There is some further inquiry both for spot lots and for the last quarter, but sellers are not pushing matters, as they expect the next movement will carry prices to a somewhat higher level than those of to-day. At the same time business would be taken at $15.50, but that appears to be the minimum according to the feeling which now prevails. Low Phosphorus is also in better demand, with sales at $20.55 to $21 for nearby deliveries, some being for 500 to 1000 ton lots. The general feeling is one of quiet confidence, but there is little or no speculative feeling, so that buyers are satisfied when they can cover their requirements for two or three months ahead. There are some who ask for quotations for the first quarter of 1906, but these are people who have certain knowledge of what their needs will be and wish to provide accordingly. Consumption in all lines promises to be very large. It will probably be larger than might be supposed from the present attitude of buyers, as they have hardly begun to feel the pressure as they are likely to feel it a little later on. Several reasons could be given for the present inactivity (?) (this in a comparative sense), but as the full effect of the bounteous crops begins to be felt it will be strange indeed if business does not receive a renewed impulse and start things on a much larger scale than has been experienced during the past five or six months. Prices are more favorable to buyers than they were at that time, and if production does not increase too rapidly there should be a good basis for somewhat higher prices during the later months of the year. Meanwhile, however, the present range for city and nearby deliveries is about as follows:

No. 1 X Foundry	$17.25 to $17.50
No. 2 X Foundry	16.25 to 16.50
No. 2 Plain	15.75 to 16.00
Standard Gray Forge	14.75 to 15.00
Basic	15.50 to 15.75
Low Phosphorus	20.50 to 21.00
Southern No. 2 X, rail	15.50 to 15.75
Southern No. 2 X, on dock	15.00 to 15.50
Southern Gray Forge	14.50 to 14.75

Ferromanganese.—The situation is somewhat peculiar for the reason that while $46 is quoted shipments cannot be guaranteed within any reasonable time, and to be sure of prompt deliveries something near $47 would have to be paid.

Ferrosilicon.—Quotations range from $92 to $95 for 50 per cent. Silicon, with small sales within the range named.

Steel.—There is a good demand for Steel and prices are strong at $27 to $27.50, delivered, for ordinary Open Hearth Steel. Forging Billets are quoted at $30 to $32, according to carbons required.

Muck Bars.—There is absolutely no demand, so that prices are purely nominal at about $27 to $27.50, seller's mill. The leading buyers have increased their puddling capacity to such an extent that they are independent of outside makers and will buy only as they may have need under special emergencies.

Plates.—It may seem a little unorthodox to say that business is not active, but such is the fact, nevertheless. Of course the output is almost as large as it ever was, but the capacity for production is larger; consequently there is a surplus for production which manufacturers would like to utilize. Prospects are very good, however, and hopes of improvement are quite strong. Meanwhile prices are unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under	1.63½	1.68½
Flange or Boiler Steel	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100 pounds extra.
3-16-inch thick	$0.10
Nos. 7 and 8, B. W. G	.15 "
No. 9, B. W. G	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Structural Material.—In this department mills are full to the utmost limit. Early deliveries are difficult to arrange, and for almost anything within 90 days special prices have to be paid. Mills are booked so far ahead that it is almost impossible to get anything promised for this year's delivery, and in some instances it may be well into next year before anything can be had. Prices firm, as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—Steel Bars are scarce, and deliveries are in many cases weeks behind the dates promised. The demand is not specially heavy, but as material cannot be had it gives the appearance of an unusually large consumption. Refined Bar Iron can be had without much difficulty, but the scarcity of Steel ought to help Bar Iron, and it no doubt will do so in the near future. Prices remain as last quoted—1.63½c. for either Refined Iron or Soft Steel Bars.

Sheets.—There is a better demand for Sheets and mills have nearly double the orders they had on their books a week ago. Specifications are coming in more promptly and the outlook in the Sheet trade is decidedly better, although prices remain as last quoted—viz., 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70c.

Old Material.—Rolling mill Scrap is active and firm, but there is no improvement in the demand for melting stock. Consumers of Steel refuse to pay over $15.50 for large lots of good stock, but holders are somewhat tenacious at $16 and expect to get that or more as soon as there is anything like a fair demand. Bids and offers are as follows for deliveries in buyers' yards:

Scrap Steel Rails	$16.00 to $16.25
No. 1 Steel Scrap	15.50 to 16.00
Old Steel Axles	20.50 to 21.00
Old Iron Axles	24.00 to 25.00
Old Iron Rails	20.50 to 21.00
Old Car Wheels	15.50 to 16.00
Choice Scrap, R. R. No. 1 Wrought	19.50 to 20.50
No. 1 Yard Scrap	17.50 to 18.00
Long and Short	16.50 to 17.00
Machinery Scrap	14.50 to 15.00
Wrought Iron Pipe	15.00 to 15.50
No. 1 Forge Fire Scrap	15.00 to 15.50
No. 2 Light Ordinary	11.50 to 12.00
Wrought Turnings	13.50 to 14.00
Axle Turnings, Choice, Heavy	14.00 to 14.50
Cast Borings	9.75 to 10.00
Stove Plates	12.50 to 13.00

Pittsburgh.

PARK BUILDING, August 23, 1905.—(*By Telegraph.*)

Pig Iron.—Interest in the Pig Iron market centers in the expected purchase by the United States Steel Corporation of 40,000 to 50,000 tons for September delivery. It may possibly buy for October also, in which event the amount will be from 75,000 to 100,000 tons. The price is practically certain to be $14.50, at Valley furnace, or $15.35, Pittsburgh. This figure is the minimum of the market today on both Bessemer and Basic Iron, and we note sales of about 3500 tons at this price. As yet nothing has been done with the inquiry of the Midvale Steel Company for 5000 to 10,000 tons of Bessemer for balance of this year delivery, but the business may be closed before this week is out. The price will probably be $15, Valley furnace, on account of the deliveries running so far ahead. There is some inquiry for Foundry Iron and a local consumer has bought 1000 tons at about $14, Valley furnace, for Northern No. 2. Furnaces generally quote $14.25 to $14.50 at furnace, but on desirable business $14 can be done. Forge Iron is very dull and prices have declined sharply. We quote Northern brands of Forge at about $14, Pittsburgh, but are not advised of any sales.

Steel.—Conditions in the Steel market show no actual change, the demand for Billets and Sheet and Tin Bars being heavy. Prompt Steel, especially Open Hearth, is very scarce and commands premiums in prices. Most leading consumers are covered by contracts, and the amount of Steel bought in the open market is relatively small. We quote Bessemer and Open Hearth Billets at $24, and Sheet and Tin Bars in random lengths $25 to $25.50, maker's mill. As stated above, Billets, Sheet and Tin Bars for prompt delivery would probably command premiums of $1 or $2 a ton over above prices. It is understood that the Carnegie Steel Company is out of the market as a seller of Steel for the balance of the year, having all the tonnage it can take care of for the next three or four months.

(*By Mail.*)

The United States Steel Corporation is figuring on the purchase of a round lot of Bessemer Pig Iron for September delivery, but may possibly decide to buy for September and October shipment, in which case the quantity may run up to 100,000 tons. The fact is pretty generally known that the corporation is in the market for Pig Iron and a great many sellers of material are inclined to hold off making sales waiting until the corporation has bought, in the belief that when it does buy the whole market on raw materials, such as Pig Iron, Steel, Scrap and Coke, will become stronger. General conditions in the Iron trade are showing betterment all along the line and prices on nearly all kinds of material are firmer than for some months. While the actual buying of Pig Iron is small we can report a good many inquiries in the market, one from the Midvale Steel Company, Philadelphia, calling for 5000 to 10,000 tons of Bessemer Iron for shipment over balance of this year. The business has not yet been closed, but prices have been quoted ranging as high as $15.50 at Valley furnace. However, the tonnage if placed is likely to be taken at about $15, Valley furnace, which is an advance of 50c. a ton over prices quoted for August and September Iron. There has been quite an activity in Low Phosphorus Iron, two local concerns having bought about 1000 tons in the past week on the basis of $21.50, Pittsburgh. There is a fair movement in Foundry Iron and prices are reasonably firm, but when a good sized inquiry comes in the market there are a few furnaces that are willing to make a relatively low price to get the business. Northern brands of No. 2 Foundry are held at $14.25 to $14.50, Valley furnace, but on good sized tonnage some sellers would accept $14, at furnace. There is absolutely no buying of Forge Iron and prices have declined sharply. An inquiry was in the market last week for 1000 tons and as low as $14.25, Pittsburgh, was quoted without getting the business. It is probable that very close to $14, Pittsburgh, for Northern brands of Forge Iron could be done on a firm offer. The situation in Steel has reached an acute stage and premiums of $2 a ton have recently been paid for Open Hearth Billets for prompt shipment. Bessemer Billets are held at $24 to $25 and Open Hearth $26 to $27, maker's mill, the higher prices being asked for prompt delivery. Sheet and Tin Bars, in random lengths, are held at $25.50 to $26, but there are few buyers as most of the Sheet and Tin Plate mills are covered for their full supply by sliding scale contracts. New tonnage in Finished Iron and Steel is showing a perceptible increase, particularly in lines that have been dull for some time, such as Pipe, Sheets and Tin Plate. Prices on Tubular goods are very low, and this accounts to some extent for the increased tonnage that is being placed. We note a continued active demand for Plates, Structural Steel and Steel Bars, all of the mills being two to four months behind in deliveries. Sharp premiums have recently been paid on Beams and Channels for prompt delivery. Indications favor a very large trade for balance of this year, and several officials of a leading Steel interest have recently expressed themselves to the effect that they expect 1906 to be a banner year in the Iron trade.

Ferromanganese.—There is quite an active demand for Ferro, several consumers in this district being in the market for good sized lots and extended delivery. There promises to be a scarcity of Ferro for prompt shipment and several of the leading importers will not sell except for delivery beyond November. We note sales of about 200 tons of foreign 80 per cent. Ferro at about $49, delivered. We quote the market at $49 to $50, delivered, depending on size of the order.

Rods.—The demand continues light, but prices are fairly strong. We quote Bessemer and Open Hearth Rods at $32 and Chain Rods at $33, maker's mill.

Steel Rails.—Some heavy contracts have been placed and the Rail mills are practically assured of full work up to the close of the year. Efforts of leading roads to bring about a reduction in the price of Rails have been without success, and it seems that the present price of $28 for Standard Sections will be maintained indefinitely. Light tonnage for the lake Ore boats they now have under construction. Prices are firm and we quote: Tank Plates, ¼ Rails are also firmer and are held at $24 to $28, at mill, depending on Sections.

Skelp.—Considerable tonnage has recently been placed for export and some fair sized domestic orders have also recently been given out. It is stated the Skelp mills have more tonnage on their books now than at any time for three or four months. Prices are unchanged, but fairly strong, and we quote: Bessemer Grooved Skelp, 1.50c. to 1.55c.; Open Hearth, 1.55c. to 1.60c.; Sheared, $1 advance; Grooved Iron Skelp, 1.60c.; Sheared, 1.67½c. to 1.70c., maker's mill.

Plates.—New tonnage in Plates continues to come in very satisfactorily and the mills are filled up for the next two to four months. Some very large car orders are in prospect, while the shipbuilding interests are taking a heavy inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges	$0.10
Gauges No. 7 and No. 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A.," and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—While a great deal of new business is in sight, actual contracts being placed are not as heavy as they were some time ago. This, however, does not inconvenience the Structural makers, who have all the work on their books they can possibly turn out in the next three or four months. In view of the heavy demand for Structural Shapes that has been a feature of the market for some months, and the fact that the mills have so much tonnage on their books and are so far behind in deliveries, it would not be surprising if an advance in prices was made before long. As it is now, some of the small Structural concerns are paying premiums of $2 to $3 a ton for prompt shipment. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—Some of the leading Sheet mills report a heavy increase in orders, while others state that so far business with them has not shown any betterment. The leading interest is understood to be booking orders quite heavily and for extended delivery. Prices of Sheets are firmer, in sympathy with the higher prices and scarcity of Sheet Bars, all of the mills rolling Sheet Bars being considerably behind in

deliveries to their customers. We quote: Black Sheets, box annealed, one pass through cold rolls, No. 24 gauge, 2.05c. to 2.10c.; No. 26, 2.15c. to 2.20c.; No. 27, 2.20c. to 2.25c.; No. 28, 2.25c. to 2.30c. The lower prices quoted on Black Sheets represent minimum of the market and are obtainable only on large tonnage. Galvanized Sheets are quite firm and we quote: Nos. 22 and 24, 2.75c. to 2.80c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.10c. to 3.15c.; No. 28, 3.30c. to 3.35c. We quote No. 28 Gauge Painted Roofing Sheets at $1.65 to $1.75 per square, and Galvanized Roofing Sheets, No. 28 gauge, at $2.85 to $2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—Some additional contracts for Steel Bars have been placed by the leading agricultural interests and the larger Bar mills are full of work and are from four to six weeks behind on shipments. As noted last week, the demand for Iron Bars is also showing betterment and the mills rolling both Iron and Steel Bars are very comfortably fixed with tonnage. We quote Steel Bars at 1.50c., base, half extras, f.o.b. Pittsburgh, for carloads and larger lots. Iron Bars are firm on the basis of 1.60c., Pittsburgh.

Hoops and Bands.—A moderate amount of new tonnage is being placed, while specifications on old contracts, placed when prices were lower than they are now, are coming in very nicely and the mills rolling Hoops and Bands are quite busy. We quote Bands at 1.50c., extras as per Steel card, and Hoops at 1.65c., at mill.

Tin Plate.—Some of the leading mills report a slightly better demand, while others state they can see no improvement in business as yet. However, the American Sheet & Tin Plate Company has recently started two or three of its largest plants and is getting ready to start up others, and this would indicate that considerable new business in Tin Plate is being placed. We quote Tin Plate at $3.50 to $3.55, base, terms 30 days, less 2 per cent. off for cash in 10 days. Some of the jobbers who still have good sized stocks and also a few of the outside mills are shading these prices to some extent.

Merchant Steel.—A good many season contracts have been placed this month and the mills now have so much tonnage on their books that they are much firmer in their ideas of prices. Prices continue firm and we quote: Flat Sleigh Shoe, 1.50c. to 1.55c.; Toe Calk Steel, 2c. to 2.05c.; Smooth Finished Tire, 1.65c. to 1.70c.; Cutter Shoes, 2.15c. to 2.20c.; Railway Spring Steel, 1.65c. to 1.70c.; Crucible Tool Steel, 5½c. to 8c. for ordinary grades; special grades, 12c. and upward. Shafting is in fair demand, discounts being 50 per cent. off in carloads and 45 per cent. in less than carloads. For delivery at certain competitive points these discounts are slightly shaded by one or two concerns.

Spelter.—The market has quieted down somewhat after its recent activity, but prices remain firm. We quote fine grades of Western Spelter at 5.60c., St. Louis, equal to 5.72½c., Pittsburgh.

Merchant Pipe.—The relatively low prices ruling on Pipe have caused a perceptible increase in the demand, the tonnage entered so far this month being very much heavier than in any similar period for some time. A prospective gas line is that of the Ohio Fuel Supply Company, which proposes to build a line to convey natural gas from Columbus to Cincinnati. If laid, the line will either be an 18-inch one or two 12-inch lines. As noted in this report for several weeks, actual prices on Pipe are above five points lower than the official discounts, and on Merchant sizes are from 79 to 80 off, the latter being an extreme price to the larger trade. These official discounts, which as stated are being shaded four to five points, are as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ and ¼ inch	67	51	65	49
⅜ and ½ inch	71	59	69	57
¾ to 6 inches	75	65	73½	63½
7 to 12 inches	70	55	68½	53
Extra strong, plain ends, ⅛ to ⅜ inch	60	48	58	46
½ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong, plain ends, ⅛ to 8 in.	56	45	54	43

Boiler Tubes.—Conditions in the Boiler Tube trade continue excellent, demand being heavy and the mills behind on deliveries. Prices are firm, discounts to consumers being as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ inches	41	44
1⅜ to 2¼ inches	41	56
2½ inches	46	58
2¾ to 5 inches	53	64
6 to 13 inches	41	56

Coke.—While no large contracts for Coke are being placed, there is a fair demand for both Furnace and Foundry and prices are quite firm. The feeling is general that prices of Coke will be better in the latter part of the year, and for this reason Coke producers are not willing to sell ahead or for balance of this year except at a sharp advance in prices that are quoted for this and next month's shipment. Out of a total of a little over 30,000 ovens in the Upper and Lower Connellsville regions 25,662 were active last week, the output of both regions being given as 335,000 tons. We quote strictly Connellsville Furnace Coke at $1.80 for August and September shipment and $2 for balance of the year delivery. Connellsville 72-hour Foundry Coke is held at $2.25 to $2.35 for prompt delivery and $2.50 on contracts for balance of the year. Main Line Furnace Coke, made outside the Connellsville region and which is not quite as high in quality as strictly Connellsville, is held at $1.50 to $1.60 and Foundry from $1.85 to $2 a ton, at oven.

Iron and Steel Scrap.—Consumers of Scrap are not willing to pay the higher prices asked by dealers and the latter are not willing to make concessions, so that there is something of a deadlock on in the Scrap market and very little material is changing hands. Scrap dealers have the idea that if the Steel Corporation buys a round tonnage of Bessemer Pig Iron it will help prices on Scrap, and for this reason they are disposed to hold their Scrap in preference to making lower prices to effect sales. Prices are quite firm and we quote: Heavy Melting Scrap, $15 to $15.50; No. 1 Wrought Scrap, $15.50 to $16; Cast Iron Borings, $8.25 to $8.50; Bundled Sheet Scrap, $13 to $13.25; Cast Steel Scrap, $14.50; Machinery Cast Scrap, $14.50; Old Steel Rails, short pieces, $15 to $15.50; long pieces, $15.50 to $16, all in gross tons, f.o.b. Pittsburgh. A sale of 1000 tons of Heavy Melting Scrap to a local consumer is reported at $15.50, delivered.

Cincinnati.

FIFTH AND MAIN STS., August 23, 1905.—(*By Telegraph.*)

Pig Iron.—Reports from other sections indicate that there is less activity in this territory than others. The market appears to be strong and prices are well established, but the reaction from the heavy buying movement of a few weeks since is difficult to overcome and recovery is slow. Good inquiry is reported for Malleable and Basic Irons, but Southern Coke grades are very quiet. We are told that there appears to be a weakening tendency on the part of some Southern furnaces and considerable tonnage from Tennessee furnaces is coming into this territory at slight concessions to meet competition of the Northern product. Gray Forge and the lower grades generally are said to be in abundant supply and can be bought below schedule prices. The Northern situation is apparently stronger, due largely to the contemplated heavy buying of the United States Steel Corporation. The general foundry trade is reported to be fairly busy. Sales in this territory during the week were for immediate needs and in small tonnage. Selling agents say there are no inquiries in sight for anything in the shape of heavy business and the situation is without feature. Southern No. 2 is fairly well established on an $11.50, Birmingham, basis, and while some concessions have been made under this figure to move spot Iron we feel assured that this quotation represents the minimum. On the other hand, some furnaces are holding at $12, Birmingham, and this is maximum. Northern No. 2 is firm at from $14 to $14.25, furnace. We are advised of the sale of considerable tonnage of Southern Iron to a central Ohio stove manufacturer, the amount not being stated and price confidential. A sale of 5500 tons of Basic and 8000 tons of Malleable is reported to a St. Louis concern. One of the large electrical companies at Milwaukee bought 6000 tons of Northern and 2000 tons of Southern for delivery over the first quarter of next year, paying $12, Birmingham, for the Southern. A large Cast Iron Pipe industry in this territory, it is thought, will soon be in the market for considerable tonnage, as it is consuming an immense amount of Iron, trade being very active. Freight rates from the Hanging Rock district, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$14.75 to $15.25
Southern Coke, No. 2	14.25 to 14.75
Southern Coke, No. 3	13.75 to 14.25
Southern Coke, No. 4	13.25 to 13.75
Southern Coke, No. 1 Soft	14.75 to 15.25
Southern Coke, No. 2 Soft	14.25 to 14.75
Southern Coke, Gray Forge	13.00 to 13.50
Southern Coke, Mottled	12.75 to 13.25
Ohio Silvery, No. 1	18.15 to 18.40
Lake Superior Coke, No. 1	15.65 to 15.90
Lake Superior Coke, No. 2	15.15 to 15.40
Lake Superior Coke, No. 3	14.65 to 14.90

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$17.75 to $18.25
Lake Superior Car Wheel and Malleable	17.75 to 18.00

Coke.—This market is strong and is gradually moving forward, and while prices remain about the same the withdrawal of the lower grades from the market is very noticeable. Ovens in several of the regions are said to be unable to supply the demand. We quote the best grades of Connellsville Furnace from $2 to $2.10 and Foundry from $2.40 to $2.60, f.o.b. ovens.

Finished Iron and Steel.—Considerable new business

has been booked and the market in Structural is strong and very active. The demand for Bars and Plates is good and all the mills are well taken care of. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—The Scrap Iron market is very quiet and is about keeping pace with the Pig Iron market. Prices obtainable are unchanged from last week. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $14 to $15 per net ton; No. 1 Cast Scrap, $12 to $12.50 per net ton; Iron Rails, $18 to $19 per gross ton; Steel Rails, rolling mill lengths, $13 to $14 per gross ton; Relaying Rails, 56-lb. and upward, $22 to $23 per gross ton; Iron Axles, $19 to $20 per net ton; Car Wheels, $14 to $15 per gross ton; Heavy Melting Scrap, $12 to $12.50 per gross ton; Low Phosphorus Scrap, $14 to $14.50 per gross ton.

The National Reciprocity Convention.

Advocates of tariff revision and reciprocity met in convention at the Illinois Theater, Chicago, August 16 and 17. There were about 800 present. A leading part in the convention was taken by Alvin H. Sanders, editor of the *Breeders' Gazette*. The live stock and farming interests of the country predominated somewhat over the manufacturing and mercantile interests, though the latter were represented largely. The result of the deliberations of the convention was the adoption of the following platform:

The National Reciprocity Convention, representing more than 200 agricultural, commercial and industrial associations of the United States, by delegates assembled at Chicago August 16 and 17, 1905, hereby makes the following declaration of principles:

Whereas, The agriculture, manufactures and other industries of this country have expanded to such an extent that they can no longer depend upon the home market for the consumption of their entire product; and

Whereas, The export trade has become a vital support to many of our industries; and

Whereas, The present commercial attitude of the United States, largely owing to our failure to carry into effect the reciprocal trade provisions of section 4 of the Dingley law, is antagonizing foreign nations, whose good will we desire and on whom we have hitherto depended as purchasers of our surplus products; therefore be it

Resolved, First, that this convention, recognizing the principle of protection as the established policy of our country, advocates immediate reciprocal concessions by means of a dual or maximum and minimum tariff as the only practical method of relieving at this time the strained situation with which we are now confronted;

Second, that eventually the question of the schedules and items to be considered in reciprocal concessions be suggested by a permanent tariff commission, to be created by Congress and appointed by the President, which shall consist of economic, industrial and commercial experts;

Third, that it is the sense of this convention that our present tariff affords abundant opportunity for such concessions without injury to industry, trade or the wages of labor.

Fourth, that we urge action upon Congress at the earliest time possible.

The Committee on Resolutions was composed as follows: E. N. Foss, Massachusetts; A. H. Sanders, Illinois; Edward D. Page, New York; A. B. Farquhar, Pennsylvania; W. A. Harris, Kansas; Frank J. Hagenbarth, Idaho; William Larrabee, Iowa; Murdo Mackenzie, Colorado; Marion Sansom, Texas; Charles P. Sentor, Missouri; Conrad Kohrs, Montana; W. H. Hatton, Wisconsin.

Governor A. B. Cummins of Iowa was the ruling spirit of the second day of the convention, and from the time of his entering the hall he was recognized as the leader of the movement. From that time also the "Iowa idea" of trade reciprocity prevailed. Frequent reference was made to the imminent exclusion of American goods from Germany and to the hostility of Russia, France and other foreign countries toward American goods, which hostility was attributed wholly by the speakers to the fact that we in turn practically excluded the importation into this country of goods made in the countries named and that we could expect nothing else than retaliation.

At least 200 of those present were accredited delegates from agricultural, commercial and industrial associations, including the Illinois Manufacturers' Association and similar bodies from other States. From the start there were two elements prevailing. One sought the adoption of maximum and minimum tariffs, the maximum to prevail against countries that discriminated against the United States and the minimum to be in force with countries that favored us, while the other element favored the ratification of commercial reciprocity treaties with such countries as would enter into such arrangements, leaving the tariff to stand as it is for other countries. There was also represented a strong element that favored a horizontal reduction of import duties, one speaker stating that he believed it would be better to cut a slice off the top of the wall than to batter holes into it at intervals.

A resolution was passed empowering the chair to appoint a committee of fifteen who should have the power to organize a permanent body to be known as the American Reciprocal Tariff League and to prosecute further the work for which the convention was assembled. The names of this committee have not yet been announced.

Central American Notes.

SAN JOSÉ, C. A., August 7, 1905.—The reported purchase by the Rockefeller interests of the Gracias a Dios region in Nicaragua has given new life to American investments in these countries. The mines and minerals as well as the navigation of all rivers seem to be included in the new cession by the Government. At least two new railroads are to be built through the coffee and mining districts to tap the lake country, which is very fertile, and to-day partly tributary to the Pacific ports.

Fever conditions on the northern coast are improving, and probably full business activity will be resumed within a month or so.

It looks as though the President of Guatemala has been able to keep down incipient revolutions, so that the work of the Northern Railroad has gone on without interruption. Imports bid fair to be larger than usual, due to the enhanced prices of coffee and increased size of coffee crops. In Honduras and San Salvador they are paying some attention to the cultivation of cotton.

Salvador is making improvements at two of her ports, Truinfo and Acajutla, where new piers are to be built if the old wharfs are found inadequate. The latter port is badly in need of a lighthouse on the dangerous reef just south of the town. In a short time fully half a dozen steamers have gone down on these rocks. An English company has been arranging to put in a bid for a steel lighthouse at Point Remedios.

The news from the south is that the Paraguayan Congress has authorized the purchase from a German firm of an iron clad of the Plata type. In Buenos Ayres a new electric line is under construction as far as Lujan. The alliance, commercial and otherwise, of Bolivia and Chile will quickly render the first named country accessible to foreign commerce. A loan will be made by Chile to complete the La Paz Railway to the coast of the Pacific, and it is expected that in two years at most the line will be in thorough running order.

Peru produced $16,000,000 worth of sugar last year and exported nearly 9000 tons of cotton. This does not need to be sown annually, and the quality is only second to the Sea Island. There are only 1700 km. of railroads in Peru, and no country in the world is more in need of railroads than this one. Immense fertile valleys are separated from the coast by the Andes Chain, rising often to a hight of 18,000 to 20,000 feet. The Callao Railroad reaches Oroya, and that from Mollendo goes as far as Puno, but a great deal of work is needed before the sources of the Amazon are reached and thereby get a route to the Atlantic. American enterprises are either railroad or mining here, and the Government aids both in every possible way. The commerce of this coast is still largely in the hands of German firms. But this has not come to them suddenly; it has been patiently worked up from nothing or nearly nothing to its present proportions. With long credits and a thorough study of requirements and conditions the German merchant has advantages of no mean order in the competition for trade.

C.

Progress Under the New Trademark Law.

WASHINGTON, D. C., August 22, 1905.—Some surprising figures showing an enormous increase in the applications for the registration of trademarks under the new law, which went into force April 1 last, have been compiled by the officials of the Patent Office. It appears that in the first four months under the new statute no less than 12,000 applications have been received, and it is estimated that the total for the year ending April 1 next will exceed 20,000. The magnitude of these figures will be appreciated when it is stated that during the entire 11 years in which the original trademark act of 1870 was in force the total number of applications was slightly less than 12,000, of which approximately 8000 were allowed registration, or an average of a little more than 1000 applications and 700 registrations per annum. It would be difficult to cite more graphic figures than these, especially when it is remembered that but 35 years have passed since the act of 1870 was placed on the statute books.

Comparison with Act of 1881.

The comparison here presented represents the work under the first statute providing for the registration of trademarks and under the present law, but does not cover the interesting period from 1881 to 1905, during which the second trademark act was in force. In the 24 years of this period 60,000 applications were received, or approximately 2500 per annum. Of this total 36,166 cases were allowed registration, or about 1500 per annum. While the annual average of applications under the law of 1881 was more than twice as great as under the act of 1870, the registrations, while actually more numerous, were relatively smaller. This was due to special reasons, the most important of which were, first, the fact that the restrictions of the act of 1881 were more severe, no provision being made for the registration of marks used exclusively in interstate commerce, and, second, because a large number of applications under the law of 1881 pending in the Patent Office when that statute was repealed last April were carried over under the new law and may yet be allowed registration.

It is not practicable at this time to present a comparison of the registrations allowed under the new law with those recorded under previous trademark statutes, for the obvious reason that a large proportion of the cases filed since April 1 are still under consideration.

Estimate of Future Filings.

Of course it is not to be expected that applications for the registration of trademarks will continue to be filed at the rate that has prevailed since the law took effect on April 1. One reason for the large number of filings is the fact that many owners of trademarks secured under the act of 1881, but limited thereby to commerce with foreign countries and the Indian tribes, have deemed it advisable to have them reregistered under the new statute so as to cover interstate commerce. It is also a fact that a large number of applications have been filed under what is known as the "ten-year clause," the trademarks involved being such as were employed by owners or assignors for ten years prior to the passage of the new law but not yet registered in the Patent Office. There will undoubtedly be a material decline in the number of applications after the close of the current year, and it is the best opinion in the Patent Office that the average number of filings in the future will be about 10,000 per annum, of which it is probable that approximately 8000 registrations will be allowed.

It is an interesting fact that the present tendency is toward the adoption of a better class of trademarks. Owners of marks have learned that originality and a striking appearance count for a great deal, and they are also being taught to devise marks that meet the requirements of the law. It is confidently predicted that under the new statute the ratio of registrations to applications will be greater than under previous acts, a fact that will be due in a large measure to the intelligent care shown by manufacturers and dealers in selecting distinctive, original devices for the identification of their wares.

W. L. C.

OBITUARY.

DAVID EVANS.

One of the foremost of British iron works managers, well known in the United States, David Evans, died August 8 at Saltburn-by-the-Sea, after a lingering illness. He was born at Aberdare, Glamorganshire, England, in 1841, his father being manager of the Aberdare Iron Works, belonging to Richard Fothergill. There Mr. Evans received his practical training, and he may be said to have spent his whole life in connection with the manufacture of iron and steel. He early showed the ability for which he has since been distinguished, for in 1866, when in his twenty-fifth year, he succeeded his father as blast furnace manager at Aberdare. In 1870 he became manager of the blast furnaces, forges and mills at Rhymney, Monmouthshire, where he remained until 1875. Then he passed on to the works managership of the Ebbw Vale Iron & Steel Company's establishment, which included blast furnaces and rolling mills. In 1878 he returned to Rhymney and occupied the post of resident manager for seven years, when in 1885 he was appointed general manager of the Barrow Hematite Iron & Steel Company. In 1891 the directors of Bolckow, Vaughan & Co. offered Mr. Evans the general managership of their works, which he accepted, and for 13 years he occupied that post, until ill health compelled him to relinquish the position last October.

NOTE.

R. M. DAELEN of Düsseldorf, who was identified for many years with the development of the iron and steel industry of Germany as an engineer, died at the age of 63 at Baden-Baden. Mr. Daelen was famous as a designer of rolling mill machinery and for the introduction of labor saving appliances. He was a frequent contributor to the transactions of German and English technical societies.

Skylights for Large Shops.—The G. Drouvé Company, Bridgeport, Conn., has established as an important part of its business the manufacture and erection of the Anti-Pluvius skylight, which, while in extensive use in Europe, is comparatively new in this country. The skylight is especially adapted for large buildings and shops where heavy machinery causes more or less vibration, which works loose all putty or cement, neither of which enters into the construction of the device. In place of these is a mechanical joint in a general way consisting of a supporting bar, upon which rests a bridge that carries the weight of the skylight. The glass rests between strips of felt and over the upper layer of felt is a cap of copper. Above all is a bridge to support the weight of people walking overhead. There is no sweating, owing to the open construction, and the glass has ample chance to play when subject to contraction, expansion, shock or vibration. A noteworthy feature is the ease with which the glass may be replaced, each piece being entirely independent.

The Bessemer Coke Company, Pittsburgh, Pa., has bought 90 acres of coal lands near Masontown, Pa., paying $100,000 for it, and will build a large number of coke ovens on the site.

The Kansas Natural Gas Company, controlled by Pittsburgh parties, has bought the People's Natural Gas Company, Coffeyville, Kan., for $900,000. This purchase gives to the Kansas Company 43,000 acres of oil and gas territory in Montgomery County, Kan.

In one day last week the 35 and 40 inch plate mills at the Homestead Steel Works of the Carnegie Steel Company turned out 1320 tons of plates, the night turn making 565 tons and the day turn 755 tons. The best previous record for the two mills was 1250 tons.

Plans are being made by engineers of the Pittsburgh & Lake Erie Railroad for the building of a double deck steel freight yard, to be located on the South Side, Pittsburgh. A large tonnage of structural steel will be used in its construction.

New York.

NEW YORK, August 23, 1905.

Pig Iron.—The market for Pig Iron has been steady and moderately active. Among the larger sales effected is one lot of 1000 tons of Basic Pig to a local Open Hearth plant and 1000 tons of Foundry Iron to a pump making works. We quote Northern Irons, at tidewater, $16.50 to $17 for No. 1 Foundry, $15.75 to $16.25 for No. 2 Foundry and $15.25 to $15.75 for No. 2 Plain. Southern Iron is selling on the basis of $15.50 to $16 for No. 2 Foundry, New York Harbor.

Steel Rails.—A mill which is able to deliver to the Gulf by water has taken an order for 15,000 tons of Rails for the Harriman system, whose total orders now aggregate 100,000 tons. Among the other orders placed during the week is one lot of 6000 tons for Mexico, 10,000 tons for the Detroit, Toledo & Ironton, 5000 tons additional for the Great Northern, 3000 tons additional for the St. Paul and 5000 tons for the Indianapolis-Cincinnati traction line.

Cast Iron Pipe.—Nothing of special importance has occurred in this branch of trade for some time. Large orders are rare, but the foundries are in receipt of fairly numerous small orders. Prices on carload lots are unchanged at $27 per net ton for 6-inch at tidewater.

Finished Iron and Steel.—While the contract for the Steel superstructure of the new Manhattan Bridge over the East River was awarded August 15 to the Pennsylvania Steel Company, a temporary injunction has been obtained in behalf of one of the competing companies which prevents the actual signing of the contract until the case is decided by the courts. A hearing will take place September 6. The demand for Structural Material continues heavy. Premiums on such quantities as are needed for early delivery are being paid as high as $10 per ton for shipment from mill and up to $20 per ton for deliveries from stock. A new mill located in eastern Pennsylvania is now in the market just in time to secure much benefit from the high prices prevailing for quick shipment. It has the advantage, of course, of not being loaded up with contracts for future delivery. It is believed that the business in Structural Material placed in this vicinity during the past week has aggregated fully 25,000 tons. The Plate trade is in good condition, with some fair tonnages coming out from buyers in this district. The demand for Bars is excellent and some difficulty is experienced in securing satisfactory shipments of Steel Bars, while it is claimed that some of the Bar Iron manufacturers are able to get premiums of $1 to $2 per ton above the official price, which was reaffirmed at the meeting of Eastern manufacturers held in this city last Wednesday. Quotations, at tidewater, for shipments from mills are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04¾c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.64½c. to 1.74½c.; Soft Steel Bars, 1.64½c. to 1.74½c.

Old Material.—The general outlook is very good. Foundrymen are buying Cast Scrap and Stove Plate freely, and some large inquiries for this class of material are in the market. Rolling mill stock can be sold if holders are willing to take a shade under current quotations, particularly strong demand being noted for Old Pipe and Wrought Turnings. Railroad Wrought Scrap is exceedingly scarce and gives indications of an advance to higher prices. Car Wheels are in excellent demand. Sales of Relaying Rails, amounting in all to about 1000 tons, are reported. The situation as to Steel Scrap is interesting. At present a deadlock exists between buyers and sellers. Buyers are making inquiries but are unwilling to pay the prices asked by sellers. The Steel works are now taking in deliveries of Scrap for which contracts were made in the spring at considerably higher prices than those now prevailing. They are evidently endeavoring to make new purchases at prices which will considerably reduce their average cost. Dealers believe that with the present exceedingly heavy consumption of Steel Scrap it will not be many weeks until consumers will be compelled by their necessities to come into the market. They are consequently making every effort to hold their position. Prices have been advanced on quite a number of articles in our list, and quotations for New York and vicinity are approximately as follows, in gross tons:

Old Iron Rails	$17.50 to $18.50
Old Steel Rails, rerolling lengths	14.50 to 15.50
Old Steel Rails, short pieces	13.75 to 14.75
Relaying Rails	21.00 to 22.00
Old Car Wheels	16.50 to 17.00
Old Iron Car Axles	19.00 to 20.00
Old Steel Car Axles	17.00 to 18.00
Heavy Melting Steel Scrap	13.75 to 14.75
No. 1 Railroad Wrought	16.50 to 17.50
No. 1 Yard Wrought	14.50 to 15.50
Iron Track Scrap	14.50 to 15.50
Wrought Pipe	12.50 to 13.50
Ordinary Light Iron	9.00 to 10.00
Cast Borings	7.50 to 8.50
Wrought Turnings	11.00 to 12.00
No. 1 Machinery Cast	14.00 to 15.00
Stove Plate	11.00 to 12.00

Metal Market.

NEW YORK, August 23, 1905.

Pig Tin.—No especial activity was shown until yesterday, when the London manipulators took hold again for another upward movement. They were successful to the extent of over £2, advancing prices up to the close to-day from £149 15s. to £152. The trading was done in afloats and this market responded promptly to the London advances. So far as consumers are concerned no change in the situation has occurred, for they are buying only according to their absolute needs and are confidently awaiting a collapse in prices. The view generally taken is that the present movement is but parallel with the many similar extravagant booms in Tin and consequently must soon meet its failure. At the close of the market to-day quotations for spot and August were 33.15c. to 33.50c. September and October delivery are quoted from 33c. to 33.50c., and the London market is now up to £152 for spot and £151 10s. for futures. Thus far this month the arrivals have aggregated 2682 tons, while it is estimated that about 2060 tons are afloat.

Copper.—Continued strength and higher prices characterized the market this week. The firmness is particularly noticeable so far as futures are concerned, for the spot market is extremely quiet. The quietness is due to the fact that the large consumers are well supplied, it being estimated that their wants are taken care of until October, and in some cases a little beyond. The spot trading is therefore of but a retail character, and the holders of the available metal for quick delivery are getting good prices. It is said in the trade that one prominent company of metal merchants practically controls the spot situation. The metal for immediate delivery commands from 16c. to 16.25c., according to quality. Casting brands are quoted 15⅝c. to 15⅞c., according to delivery. Producers are refusing to contract for the high-grade brands in any large lots beyond November, excepting on an "average price" basis. The only large transaction which has come to our attention was the sale of about 1,000,000 pounds of high-grade Lake Copper for delivery during October, November and December at 16c. This sale was consummated but a few days ago, and the seller has since refused business offered on a similar basis. The London market has advanced 10 shillings since last week, being quoted to-day as follows: Spot, £70 15s.; futures, £70 8s. 9d.; Best Selected, £75 10s. The exports thus far this month amount to 14,925 tons.

Pig Lead.—An easier tone is noticeable and on the whole the market is rather quiet. Prices remain nominally about the same here, although in St. Louis a drop of 0.10c. is to be noted. Here the metal is quoted 4.60c. to 4.70c., while in St. Louis the figure is 4.50c. London is again a shade higher, with £14 flat.

Spelter.—While from every indication in the market here the situation is weakening, predictions come from the West that higher prices are to be looked for in the near future. Some merchants here are disposed to give credence to these Western rumors, despite the lower prices which exist this week. To-day this market quoted 5.65c. to 5.75c., while St. Louis telegraphed 5.60c. These prices in themselves show that something is transpiring beneath the surface. It is plainly evident that the producers in the West are working hard for a higher level of prices, while merchants here are endeavoring to keep values down.

Antimony.—While London is a shade lower to-day Cookson's has been advanced a little in this market. It is now quoted 15c. to 16c., and other grades are obtainable at 13½c.

Quicksilver—Is lower in London, where £7 2s. 6d. is quoted, and in this market 100-flask lots have declined to $40 per flask of 75 lbs.

Nickel.—Fair business is doing in both round and small lots, but prices are the same as last quoted, with stocks on hand sufficient to meet current requirements. Large lots can be had at 40c. to 45c. per lb.

Tin Plate.—Quotations remain unchanged at $3.74 a box of 100-lb. IC Coke Plates, f.o.b. New York, or $3.55, f.o.b. Pittsburgh. In Swansea Welsh Plates remain unchanged at previous quotations, 11 shillings 7½ pence.

We are indebted to L. Vogelstein & Co., American representatives of Aron Hirsch & Sohn, Halberstadt, Germany, for the following figures of German consumption of Copper for the months January to June, 1905, as compared with the same period of time in 1903 and 1904:

	1905.—Tons.	1904.—Tons.	1903.—Tons.
Imports	52,886	56,316	43,688
Exports	6,299	4,063	5,380
Consumption	46,587	52,253	38,308

Of the above 1905 imports 44,656 tons were obtained from the United States.

The Riverview Coal & Coke Company will build 200 new coke ovens at its present works near Uniontown, Pa.

Iron and Industrial Stocks.

NEW YORK, August 23, 1905.

The most interesting development in iron and industrial stocks during the week was the advance in United States Steel preferred to its highest point on record. This was reached on Thursday, when 105⅝ was touched. On the same day the common stock advanced to 37¼, which is the highest price reached on the present movement. Prices receded from these altitudes, but the decline was not serious. The new 5 per cent. bonds sold at 98 on Friday, which is the highest point thus far reached by them. Locomotive common made a sharp advance, rising from 51⅞ on Thursday to 56¼ on Friday, but failing to hold the full advance. Can preferred sold up during the week from 69⅞ to 71, Car & Foundry preferred from 99⅞ to 102 and Republic preferred from 86¾ to 89¾. Other stocks in this category showed only slight fluctuations, but the whole list displayed decided strength the entire week. Last transactions on active stocks up to 1.30 p.m. to-day were made at the following prices: Can common 11½, preferred 71; Car & Foundry common 37½, preferred 101¾; Locomotive common 54, preferred 114½; Steel Foundries common 9⅝, preferred 39⅞; Colorado Fuel 46¾; Pressed Steel common 46¼, preferred 97¼; Railway Spring common 37, preferred 100⅝; Republic common 21⅜, preferred 88; Sloss-Sheffield common 91, preferred 107; Tennessee Coal 90⅞; United States Steel common 37, preferred 104⅞, new 5's 97⅜.

The Tin Plate Wage Rebate for Exports.—The tin plate wage agreement of July 3, 1905, between the American Tin Plate Company and the Amalgamated Association of Iron, Steel and Tin Workers contained a proviso that the wage rebate on tin plate for export is to be deducted at the rate of 1½ per cent. until August 1, 1905, after which upon notification from the American Sheet & Tin Plate Company setting forth that business conditions call for it the rebate deduction should be changed to a 3 per cent. basis, effective immediately thereafter. This notice has now been given and the Amalgamated Association has just notified its members that beginning August 15 the rebate deduction will be 3 per cent.

The Fort Wayne Iron & Steel Company, Fort Wayne, Ind., has called for a meeting of creditors to be held in Fort Wayne August 23, and it is hoped by the company that it will be permitted to continue operations, in which case it expects to pay its indebtedness in full. The financial straits in which the company finds itself are ascribed by its officers to a lack of working capital and the necessity of buying scrap iron at the highest market prices from dealers instead of being able to purchase for cash direct from producers. It is also stated that the purchase price of the old mill moved from Muskegon was excessive. Certain repairs are necessary to the plant before it resumes operation, and it is the hope of the company that financial arrangements may be made by which the mill may be put into first-class condition and operated on a business basis.

Bridge and structural iron workers employed by the Kelly-Atkinson Company, Chicago, are asking the signing of a contract, including the granting of union conditions and the closed shop, threatening trouble if their demands are not complied with. The Kelly-Atkinson Company has the contract for the construction of the third track of the South Side Elevated Railroad from Twelfth to Forty-third street and for the Englewood Elevated Railroad extension in Fifty-eighth street.

On a 23-inch mill at the Pencoyd Iron Works, Philadelphia, 429 gross tons of steel were charged and rolled into 6 x 6 inch angles in 12 hours on August 10. On August 4 at the same plant 402 tons of 12-inch beams were rolled in 10½ hours. These are remarkable records.

The machinists at Youngstown, Ohio, have demanded an advance of 5 per cent. in wages. The employers are willing to give an individual raise in wages but are not willing to give a general advance of 5 per cent. A conference is to be held this week and the matter will probably be satisfactorily adjusted.

PERSONAL.

G. W. Sherling, who has been superintendent of one of the coal mining departments of the Sloss-Sheffield Steel & Iron Company, Birmingham, Ala., for many years, has resigned to engage in mining on his own account.

C. H. Greene, formerly of C. H. Greene & Co., Syracuse, N. Y., manufacturers of foundry supplies, has associated himself with the S. Obermayer Company, Chicago, as superintendent of the department manufacturing snap flasks, floor flasks and bench and floor rammers.

H. W. Nutt, secretary for the past three years of the American Tube & Stamping Company, Bridgeport, Conn., has resigned to take a position with the Seaman-Sleeth Company, roll manufacturer, at Pittsburgh, Pa., together with one with the Superior Steel Company, Pittsburgh, Pa. It is understood that the secretaryship of the American Tube & Stamping Company will be filled shortly.

Walter E. Harrington has severed his connection as vice-president and general manager of the New York-Philadelphia Company to become assocated with J. G. White & Co., New York, as operating manager. He will supervise all of the railroad, electric lighting, gas and other properties operated by the company, and will make his headquarters at the New York office.

Thomas E. Davey, general manager of the Finished Steel Company, Youngstown, Ohio, has returned from an extended visit to the Pacific Coast.

M. Hérault of La Praz, France, inventor of the Hérault electric smelting furnace, recently sailed for Canada and will supervise the experiments in electric smelting which are to be made at Sault Ste. Marie, Ont. This experimental work is the outcome of the visit to Europe last year of the Canadian Commission on Electric Smelting.

A. J. Pitkin, president of the American Locomotive Company, is expected to return from Europe about September 1.

George C. Forgeot has been appointed general works superintendent of the Allis-Chalmers Company, with headquarters in Milwaukee.

E. S. Mills, formerly manager of the Pittsburgh Steamship Company at Cleveland and afterward assistant to the first vice-president of the United States Steel Corporation, will arrive in New York this week after an 18 months' absence in Europe.

George F. D. Trask has resigned as manager of the Duplex Roller Bushing Company, Belfast, Maine, and has accepted the office of president of S. F. Hayward & Co., New York. He makes the change to fill a vacancy resulting from the death of a relative. Arthur F. Brown, New York, formerly with the Western Electric Company, Chicago, succeeds Mr. Trask as manager of the Duplex Roller Bushing Company.

Louis R. Alberger, president of the Alberger Condenser Company, 95 Liberty street, New York, has returned from a trip to Europe.

New York Pig Iron Warrant Market.

But one sale between calls was recorded in the pig iron warrant market in the Produce Exchange during the week ending at noon to-day and that was for 200 tons of February, regular, at $15.50. The following prices were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash	$14.90	....	....	....
August	14.90	$15.35	....	....
September	15.00	15.35	$15.10	....
October	15.00	15.40	15.30	$15.75
November	15.25	15.40	15.40	15.80
December	15.25	....	15.40	15.85
February	15.25	....	15.60	15.90

Attachments have been issued against five shares of stock held by Albert F. Baumgarten of Pittsburgh in the Maryland Rail Company of Cumberland, Md., the latter being the plaintiff in the suit. The suit is on two notes given by Albert F. and D. Justice Baumgarten, trading as A. F. Baumgarten & Bro., aggregating $1454.41.

The Machinery Trade.

NEW YORK, August 23, 1905.

With plenty of inquiries in the market and an excellent running trade machinery dealers are sanguine over present business conditions and the outlook.

The Brooklyn Rapid Transit Company and the Delaware & Lackawanna Railroad closed out the lists they have had before the market during the past week, and as a result business with local machinery men was something better than ordinary.

It is understood that orders from both lists were quite generally scattered, and in the case of the Lackawanna list it is stated that no particularly large order went to any one house, but the $20,000 worth of orders were distributed among numerous sellers. It will be seen by this that the trade generally was benefited, and from all accounts more than ordinary care was exercised in selecting special machines. While there remain some few scattered orders to be placed by the purchasing departments in charge of the two lists the business has been practically entirely placed.

Reports from all parts of the country show that manufactories are working overtime to get orders out and there is still considerable delay in deliveries as a result of the large amount of orders in the hands of the average machinery manufacturer. Those who buy for export declare that they cannot get promises for early delivery in many cases, and it is stated that the foreign business now being done is considerably larger than is usual at this time of the year.

There are no large lists before the trade just now, but there are some extensive inquiries, and as soon as the summer season is over, it is said on the street, a large amount of buying will be done.

Numerous announcements to the effect that various steel companies throughout the country were preparing to erect additions to their plants have been an incentive to manufacturers of heavy machinery such as is used in steel plants. It is said that the inquiries in the market for such machinery are large and some that are now in the speculative stage call for heavy expenditures when the deals are closed. Manufacturers of boilers, heavy engines and rolling mill equipment are especially busy just now and it is difficult to get early deliveries on orders that are placed. It is said in the trade that the United States Steel Corporatiton, which has been buying extensively of late, is preparing to make some heavy purchases along machinery lines. Machines used in the production and handling of steel are operated at such high tension and submitted to such severe and continuous strain that they do not last long, and those in the trade who should know say that there are a number of plants belonging to the United States Steel Corporation for which no purchases have been made for a time and something big in the way of orders is looked for.

A number of American machinery houses took particular interest in the celebration at Cologne, Germany, on March 29 of the twenty-fifth anniversary of Alfred H. Shutte's business independence. Nearly 200 employees of the firm, accompanied by their families, and quite a contingent of representatives of American firms took a summer trip up the Rhine and enjoyed a breakfast on the Drachenfels, near Konigswinter, as well as music and dancing aboard the boat. Speeches were made extolling Mr. Shutte's business success, and more than 20 cablegrams were received from this country congratulating him on the occasion.

Arrange for Japanese Trade.

A business combination has been formed between Manning, Maxwell & Moore, 85 Liberty street, and Takata & Co., the Japanese firm, 10 Wall street, whereby various lines of machinery handled by Manning, Maxwell & Moore will be jointly exploited and sold in Japan by the two firms. Anson Richards of the export department of Manning, Maxwell & Moore will go to Japan shortly to represent that company's interests, and it is understood that the various agencies in Japan conducted by Takata & Co. will be used to promote the sale of Manning, Maxwell & Moore's lines. This alliance illustrates the fact that American machinery dealers are taking a great interest in Japanese trade, and no doubt the competition will be greatly enlivened as a result of the arrangement. Manning, Maxwell & Moore have been doing a large amount of business in Japan in the past, but it is understood that the combination was effected with a view to making a general crusade for business and covering the empire thoroughly.

The Universal Machine Screw Company, a Connecticut corporation, has been organized, with an authorized capital stock of $100,000, by F. A. Betts of New Haven, Conn., and C. F. Roach of Hartford, Conn., to build automatic screw machines. The company will equip a plant for making screws and similar pieces. The machine is the invention of C. M. Spencer. It is of the multiple spindle type and makes pieces from the bar. Ten operations can be done at one time, and as they are done simultaneously the output of the machine is determined by the length of time it takes to do the longest operation. The company has leased a two-story building at Hartford, Conn., containing about 16,000 square feet of floor space. The heating plant is installed in the building, and Polyphase motors will be used for the line shaft drive. A machine tool equipment will be installed at once suitable for manufacturing the machines, and every effort will be made to have machines ready for the market at an early date. The officers of the company are: Charles Phelps, president; Reinhold Hakewessell, vice-president; Frederick A. Betts, secretary-treasurer.

Contracts have been let for a new steel foundry to be erected by the Scullin-Gallagher Iron & Steel Company, St. Louis. The buildings will be erected by the Ritter-Conley Mfg. Company of Pittsburgh. The Morgan Engineering Company of Alliance, Ohio, will furnish four electric cranes and one electric charging machine to be installed in the structure, and the Forter-Miller Engineering Company of Pittsburgh, Pa., will erect the producers. The Scullin-Gallagher Iron & Steel Company will build its own open hearth furnace. Contracts for brick have been let to the Federal Refractories Company of Pittsburgh, Pa., and clay brick will be furnished by the Mitchell Clay Company of St. Louis. The erection of the structure will be superintended by the firm of Lichter & Jens. The Scullin-Gallagher Iron & Steel Company intends in the near future to erect a new pattern and storage warehouse and various other buildings for the storage of its raw material besides a machine shop. When the proposed improvements are completed the company will have eight 20-ton open hearth furnaces and sufficient floor capacity to take care of its output.

The United States & Nicaragua Company, which has offices in the Park Row Building, has patronized the New York machinery market quite extensively of late and will do considerably more buying, judging from an announcement of its project to develop the mineral resources of a territory comprising nearly one-third of the Republic of Nicaragua. The company, which is capitalized at $20,000,000, intends to spend at least $10,000,000, and work has been begun on two power plants, one of which will be 2000 horse-power and the other 10,000 horse-power. The company has the sole privilege of building railroads, telephone and telegraph lines in the territory it controls, according to a grant made by the Government. Modern mining equipment is being installed at a number of mines the company owns and a mill with a capacity of 2000 tons a day is being constructed. A 1000-stamp mill is also in course of construction and a hydro-electric plant will be used to drive the former mill. The company is said to control the Great Central Railroad Company of Nicaragua, and that system will be extended. The corporation has other enterprises, which it is not ready to announce as yet, but it is understood that it will be a large purchaser in the machinery market for some time to come.

The announcement that the battery invented by Thos. A. Edison for use in the propulsion of auto vehicles is to be manufactured at Orange has given the trade cause for speculation as to the amount of machinery that will be needed to equip the plant. It is understood that nothing has been purchased as yet, and it is more than probable that the New York trade will be materially benefited by the equipment of the structure very shortly. Mr. Edison states that special machinery will be used extensively in the construction of the batteries, and plans have been prepared for a building 60 x 600 feet and three stories in hight, which is to be erected near the Edison works. According to an announcement made by Mr. Edison the new batteries will propel an automobile 100 miles on a single charge. As was told in *The Iron Age* last week, Mr. Edison will be at the head of the new company and he will give the manufacture of the batteries his personal attention.

New Trolley Project.

Work has been begun at Bayway, N. J., on the construction of a trolley line between Elizabeth and Middletown by the New York & Philadelphia Company. Property rights have been acquired by the company, and it is proposed to build a fast through line between Philadelphia and New York, operated by either overhead or three-rail system. The road is being constructed under a railroad charter, and it has a 100-foot wide right of way from Trenton to Elizabeth, N. J. Ninety and 100 pound rails are to be used in the construction, and double tracks will be laid the entire distance. It is probable that freight will be carried over the road, and plans have been made, it is said, for an addition to a power house between New Brunswick and Trenton which is already constructed. The company will no doubt require considerable machinery before the project is completed.

The officers are: W. A. Stearns, president; I. H. Silverman, treasurer, and E. H. Harrington, general manager. Inquiries can be addressed to the company's Elizabeth, N. J., offices.

The Erie Railroad Company has been placing a number of belated contracts from its list and among them the following have been secured by the Buffalo Forge Company of Buffalo, N. Y.: Heating and ventilating outfit for 42-stall roundhouse at Buffalo, N. Y., requiring 220-inch fan, with belt connected 75 horse-power motor, and heater containing

15-row sections, each section 6 x 8 feet by 4 inches; heating and ventilating outfit for 43-stall roundhouse at Hornellsville, N. Y., requiring 210-inch fan, with belt connected 60 horse-power motor, and heater containing 20 two-row sections, each section 7 x 9 feet by 4 inches; heating and ventilating outfit for 21-stall roundhouse at Galion, Ohio, requiring 150-inch fan, with direct connected 8 x 10 Buffalo engine, and heater containing ten four-row sections, each section 5 x 6 feet by 10 inches; heating and ventilating outfit for 21-stall roundhouse at Huntington, Ind., requiring 150-inch fan, with direct connected 8 x 10 Buffalo engine, and heater containing 12 four-row sections, each section 5 x 6 feet by 10 inches.

The C. T. Williamson Company, manufacturer of wire novelties, 54 Camp street, Newark, N. J., is about to erect a new plant on the east side of Badger avenue, near Avon avenue, Newark, at a cost of about $25,000. The structure will be two stories in hight, of brick construction, and will be 50 x 150 feet in size. A steam power and heating plant will be installed together with a freight elevator. It is understood that the machinery has not been arranged for as yet, and those details, it is stated, will not be taken up for a couple of months.

The Morse Chain Company of Trumansburg, N. Y., is having erected at Ithaca, N. Y., a plant five times the size of its Trumansburg factory. The company was incorporated in 1898, and its plant was originally used for the manufacture of bicycle chains, but in 1901 a special high speed silent running chain was brought out and the business has been growing rapidly since. The Morse Chain Company has in service power transmission chains transmitting over 75,000 horse-power, and is furnishing drives up to 500 horse-power for a single transmission.

The Berwind-White Coal Mining Company, which has main offices at 1 Broadway, is having erected at Hollidaysburg, Pa., a large plant for repairing steel cars used to transport coal out of the company's mines. The company owns about 4500 40 to 50 ton cars and the plant will necessarily be a large one. The engineering department of the company is located at Philadelphia and the details are being arranged there. The equipment of the factory will entail a large expenditure and it is understood that part of the work is being taken up now.

The American Agricultural Chemical Company, 26 Broadway, New York, has purchased about 4 acres of land at Milton Creek, Brooklyn, near a factory owned by the company. It is proposed to build a plant on the site, but no plans have been made as yet other than in a general way. The question of machines will not be taken up, it is stated, for some time, but later on the trade can look for some purchases for the equipment of the structure.

The Termaat & Monahan Company, Oshkosh, Wis., manufacturer of marine gasoline engines, the proposed improvements of whose foundry were mentioned last week, is in the market for a considerable quantity of lathes, planers and founders' supplies. The company proposes to have its foundry in operation by the middle of next month.

The Pressed Steel Car Company of Pittsburgh, Pa., is erecting two large plants for the manufacture of steel passenger cars and steel street cars. The company will probably purchase a large amount of machinery to be installed in the structures, but no information on that point will be given for some time.

Business Changes.

R. S. Cooper, formerly representative of the Rand Drill Company at Pittsburgh, has been appointed manager of the New York office of the Independent Pneumatic Tool Company of Chicago. The New York office of the company is at 170 Broadway.

The name of the Edwin H. Jonson, iron founder and machinist, 79 East 130th street, New York, was changed to Julius Jonson Sons on August 1.

The Atco Metal Mfg. Company, Atco, N. J., has been formed to take up the business heretofore conducted by the Arthur Light Company. The new company will take over all the assets of the Arthur Light Company, but there will be no change in the management, and all contracts made by the latter company will be carried out.

The Iroquois Construction Company has awarded to the Haeberle Lumber Company, Niagara Falls, the contract for 3000 poles to be used in the construction of a power transmission line to Syracuse. It is understood that the line will run along the West Shore Railroad. The Iroquois Construction Company is connected with the Niagara, Lockport & Ontario Power Company. Up to this time the transmission of Niagara power has not been beyond Olcott, some 30 miles from Niagara. Now that it is definitely arranged to carry it further toward the center of the State a new factor must be figured with by the industries of the localities to which it will be transmitted.

New England Machinery Market.

WORCESTER, MASS., August 22, 1905.

The general condition of the machinery market has changed but little during the past week. Occasionally a dealer is heard to complain that the past few days have been dull with fewer inquiries, but this is rather the exception than the rule, especially among the manufacturers of machine tools and machine equipment generally. The labor problem is pleasantly different from what it has been in other recent inaugurations of periods of unusual prosperity, in that skilled labor is becoming more and more difficult to procure, which is in sharp contrast to the forebodings of strikes, which have menaced the metal industries of New England during the past few years.

These two elements, the absence of labor troubles and the scarcity of labor, promise to combine to give a fresh and altogether desirable impetus to the apprentice system, which has been permitted to lag to such an extent as to be responsible for a large part of the present problem of procuring the best of help in the metal lines of manufacture. If the machine shops of New England are not quite seriously handicapped by this scarcity of first-class mechanics, it will be because of an unusual and determined effort to train mediocre workmen into skilled men in special classes of machine work. As has already been stated in this column, the general labor outlook is without threat of collisions between the employer and employee. There are scattering instances where men are on strike or threatening to strike, but the tendency of the labor unions generally is to let well enough alone, and the number of union shops is on the decrease. Wages in machine shops are high, as the natural result of demand exceeding supply, and there is no doubt but that among the machinists, as well as other branches of labor represented in the shops, the men will earn more money by letting things go on as they are than they would if they should make demands for some uniform increase. They seem to understand this very well. At any rate the more intelligent among their number, who are usually higher class of workmen, so express themselves.

Interests representing the Union Machine Company and the Union Screen Plate Company, Fitchburg, Mass., have bought 100 acres of land at Westminster, Mass., on the line of the Fitchburg division of the Boston & Maine Railroad. A considerable plant will be erected on the premises. The details of the buildings have not been completed, but they will include a shop for the Union Machine Company not less than 200 feet long, and an iron and brass foundry, which will care for the needs of both companies. The Union Screen Plate Company will have a machine shop in a separate building, and there will be storehouses for both establishments. The purchase also includes valuable water power and flowage rights. A considerable amount of new machinery will be required, including a traveling crane in the Union Machine Company's shop, but full details of the equipment are not yet available. The Union Machine Company manufactures paper making machinery, and the Union Screen Plate Company manufactures brass screens used in the paper manufacturing industry. The Union Company is controlled by Emmons Crocker and Adams Crocker, and Edward J. Welch represents the Screen Plate Company in the transaction.

The E. M. Dart Mfg. Company, Providence, R. I., manufacturer of union couplings, is erecting an addition to its plant 42 x 114 feet. The building will be used for storage purposes and for heavy machinery. Some new tools have already been purchased and some other special machines will be required later. The business of the company for the past 12 months shows an increase of 50 per cent. as compared with the corresponding previous 12 months. The company is now 80,000 union couplings behind on its orders.

The new foundry of the White-Warner Company, Taunton, Mass., manufacturer of ranges, will be given up to the making of castings for the Hueber-Hodgman Printing Press Company of that city and general machine work. The Hueber-Hodgman Company formerly had its castings made by contract with the Taunton Locomotive Mfg. Company, Taunton, which is now being liquidated. This new foundry is 65 x 117 feet.

Fred. W. Dixon, formerly head of the foundry department of the Taunton Locomotive Mfg. Company, Taunton, Mass., has been made superintendent of the White-Warner Company of that city. The late Charles P. White had charge of the shop end of the business and Mr. Dixon takes his place in that department of the management.

The Davenport Machine Tool Company, which for the past five years has had its machinery built by the Morse Twist Drill & Machine Company, New Bedford, Mass., is removing its business to Springfield, Mass., where it has rented the third floor of one of the Morgan steam power plant buildings. The company will continue the manufacture of automatic machines for parts of clocks, &c. W. S. Davenport is treasurer and general manager. The company has a foreign trade of considerable proportions as well as with the clock companies of this country.

The Wallingford Gas Light Company, Wallingford,

Conn., has been purchased by C. F. Thompson & Co., who propose to make material improvements to the property, including a pipe line to the towns of Yalesville and Tracy, Conn., which means the laying of 32,000 feet of main.

The New York, New Haven & Hartford Railroad is not yet ready to make definite announcement concerning its proposed new locomotive repair shop. As has been stated, the general plan is to locate shops to cost approximately $1,000,000 at Norwood, Mass., and the general expectation is that a decision will be reached so that work will be done this season. The trade is watching keenly for the time when new machinery will be bought, as a large sum of money will be spent in securing a modern equipment.

May Revive Industries.

Effort is being made to revive two important industries of Lewiston, Maine, the Carmen-Thompson Company and the Lewiston Machine Company, manufacturers of textile machinery. The assets of the latter company were sold recently, including the machinery, but the purchasers of a large part of the equipment stand ready to co-operate in a reorganization which would combine the business with the Carmen-Thompson Company. Meetings have been held at Lewiston which are said to have made progress toward the fulfillment of the project.

The Hendey Machine Company, Torrington, Conn., manufacturer of machine tools, will probably not be able to complete this season its large building, which is the chief among improvements now under way. The strike of the bridge workers of the American Bridge Company is responsible for the delay.

William R. Billings, Taunton, Mass., treasurer and general manager of the Taunton Locomotive Mfg. Company of that city, now going into liquidation, makes the announcement that he has purchased from the Wainwright Mfg. Company the patents, name and good will of the Wainwright feed water heaters, Dean reheaters, surface condensers, heat extractors and air coolers which have been manufactured in the shops of the Taunton Locomotive Mfg. Company for the past ten years. He also announces the purchase from the Taunton Company of the patterns, drawings and special tools necessary for the continuation of the Wainwright business. On and after September 1 the business will be taken up and carried on by the Alberger Condenser Company, 95 Liberty street, New York, and Home Insurance Building, Chicago. It was Mr. Billings who secured for the Taunton Company the Wainwright business when it was in its infancy, and for the past ten years he has devoted much time and thought to the development of the possibilities of the Wainwright corrugated tube. This branch of the Alberger Company's business will be carried on under Mr. Billings' direction.

It is announced that the plant of the Self-Winding Clock Company, Bristol, Conn., will be removed from that place to Champaign, Ill.

The Reversible Tube Cleaner Company, Worcester, Mass., of which Edward F. Fletcher & Co. are the proprietors, has purchased the business of the Criss-Cross Tube Cleaner Company, Clinton, Mass., and has located the business at 26 Southbridge street, Worcester. The implement manufactured will hereafter be known as the reversible tube cleaner. The tool is designed for cleaning steam boilers, automobile boilers, guns and rifles.

The Windham Silk Company, Willimantic, Conn., will build a new silk factory in that city, to be of brick, 86 x 280 feet and two stories.

A new factory building, three stories and 40 x 200 feet in size, is to be erected at Brockton, Mass., for the occupancy of the Brockton Welting Company and the Tilton Heel Company.

The McCallum Hosiery Company, Northampton, Mass., is to erect a one-story brick addition to its mill, to be 90 x 140 feet. The roof will be supported by steel trusses 16 feet between centers, with 45-foot span.

The American Graphophone Company, Bridgeport, Conn., will install a 600 horse-power Allis-Chalmers engine, direct connected with a Bullock generator, to furnish power for the several additions to the plant which have been noted in *The Iron Age*.

The Athol Machine Company, Athol, Mass., iron founder and manufacturer of machinists' tools and hardware specialties, is to erect a new building, 40 x 45 feet, for offices, storehouse and shipping rooms, which will relieve the factory buildings, giving more room for the manufacturing departments.

The N. B. Dodge Company, manufacturer of railroad specialties, which recently removed from Fitchburg to Easthampton, Mass., is erecting a foundry 25 x 40 feet.

The Peck, Stow & Wilcox Company, Southington, Conn., manufacturer of general hardware and tinners' machines and tools, has begun work on new buildings to replace those destroyed by fire at its East Berlin, Conn., plant. They will be of brick, one 32 x 80 feet and two stories, the other 16 x 30 feet and one story.

The Springfield-Hampden Motor Vehicle Company, Springfield, Mass., which will operate motor 'bus lines in that city and vicinity, will establish a repair shop, consisting of a small machine shop and blacksmith shop.

George A. Smith, Boston, Mass., is to erect a six-story fire proof factory building on Harcourt street, that city, for general manufacturing purposes. The building will be 78 x 164 feet on the ground and will cost $150,000. It will be equipped with the most modern improvements in the way of lighting, ventilation and elevator service.

Chicago Machinery Market.

CHICAGO, August 22, 1905.

Buying during the past week has been of a desultory character in that it consisted of a multitude of small transactions rather than of any individual deals of importance. The Chicago, Burlington & Quincy road is still considering bids on its large budget of machinery, reference to which has been made in this column recently, but has not yet made any award as far as can be learned. The International Harvester Company last Friday awarded machinery to local and outside interests aggregating about $15,000. The Western Electric Company is gradually moving into its new plant at Hawthorne and is a steady buyer of machinery, mostly from local sources. Indications are now that the big new plant at Hawthorne will not much more than take care of the growth of the company's business and that both that and the old Clinton street plants will be operated.

Illinois Central Railway's Improvements.

The Illinois Central Railroad is making an unusually large expenditure for machinery and mechanical equipment during the current season. The company has adopted the plan of preparing an annual budget for machinery and machine shops and equipment, and the budget just closed, the bulk of which was awarded to Niles-Bement-Pond Company, represents the expenditures for machinery up to about next July.

The largest improvement being undertaken by the road is at its Burnside shops at Ninety-seventh street, Chicago. There will be erected a new roundhouse, 90 feet deep, with 25 stalls of the size of the standard 38-stall house. An 80-foot electrically driven turntable is also being erected, and a new wheel mounting and truck shop for passenger and freight car repairs, 100 x 160 feet, one story in hight. All wheel mounting machinery in the present machine shop is to be moved to the new shop, except an axle lathe, a wheel press and a steel tire wheel lathe for engine work which will remain at the old shop.

A boiler shop, 120 x 550 feet, is being erected, brick, steel and concrete being used in its construction. This shop will have at one end a riveting tower with hydraulic equipment. The boiler shop proper will contain one 60-ton 2-trolley electrically driven Niles overhead crane, 68-foot span, and a Niles 10-ton single trolley 48-foot span crane over the machine shop bay. In addition to the large number of new machines and tools just purchased for the boiler shop, the boiler shop tools from the old plant will be removed to the new plant. The equipment of the shop will consist of electrically driven punches, shears, drills, &c., besides a large equipment of pneumatic tools. The hydraulic equipment of the boiler shop includes a riveting tower, in which will be installed a 150-ton Niles hydraulic riveter, 17 feet 6 inches gap, a 35-ton Niles hydraulic crane, 25-foot span, 50-foot lift, a 14-inch by 14-foot Niles-Bement-Pond accumulator, a 20 x 4 x 18 International duplex hydraulic pump, as well as a Niles hydraulic flange press, 11 feet 4 inches by 8 feet in the clear, with tables 10 x 15 feet. This press will deliver pressure at the rate of 1500 pounds per square inch. A 75-ton portable mud ring riveter, 15-foot throat, is also included in the equipment. All the tools of this shop will be electrically driven, the large tools by means of direct connected motors, while the small ones will be belted in groups to conveniently located motors. Current will be furnished at 220 volts d. c. by a 20 x 21 Buckeye engine, coupled to a 200-kw. 200-volt Westinghouse generator. All the tools thus far mentioned in this equipment have been purchased with the exception of certain motors which cannot be specified until the grouping is decided upon.

West of the boiler shop is being erected a transfer table, 50 feet long, with a pit 50 x 700 feet long, with a 25-foot space between the edge of the pit and the wall of the shop. The old boiler shop is being remodeled as an extension to the blacksmith shop, except 100 feet of the south end, which is being converted into a tin and pipe shop. This will enable a rearrangement of the old pipe shop and the addition of needed new equipment. The car forging department will be located in the north wing of the L of the blacksmith shop and the engine work will occupy the east and south wings. A new scrapping furnace has been erected and provided with a waste heat boiler, while the old scrapping furnace will also be remodeled and similarly equipped. The forge shop has a complete forging plant, including two 5000-pound hammers, and it is the custom of the Illinois Central road to forge old car axles into smaller shapes for its own use.

The erection of the boiler shop has necessitated the re-

moval of the bins for small scrap to the south end of the blacksmith shop, while the sorting platforms for heavy machinery scrap are still located at the west end of the new shop. A new coal and cinder handling apparatus is planned for this plant, but as far as can be learned contracts have not been made nor details decided upon.

At the Sixteenth street yards a one-story steel and concrete structure, 24 x 210 feet is being erected to serve as a tool room, subsidiary machine shop, carpenter shop, oil house and superintendent's office. In the machine shop end will be placed a 48-inch Niles steel tired wheel lathe, drill press, &c., these tools to be motor driven. This plant will make it possible to do repair work for the Sixteenth street yards, *in situ*, saving the delay incident to transporting to and from the main shops at Burnside.

The Fordham yards at Ninetieth street, Chicago, will be equipped with a gasoline driven air compressor for the purpose of testing air-brakes after trains are made up.

A 12-stall section of a standard 38-stall roundhouse, 90 feet deep, is being erected at the East St. Louis yards, and improvements are being made to the local coal and cinder handling system. Large sums of money are also being expended in improving the trackage at East St. Louis.

The roundhouse at Water Valley, Miss., is being extended by the addition of standard size 90-foot stalls and the installation of a 500-foot Laidlaw-Dunn-Gordon Cincinnati-type air compressor for the pneumatic tool equipment at these shops.

The total cost of all the improvements being made by the Illinois Central road the present year will run into the millions, the major portion of which will be embraced in track and line work. Improvements made for the machinery department alone will aggregate several hundred thousand dollars.

Some Machinery Requirements.

Zachary T. Davis, 79 Dearborn street, Chicago, is architect for the two new Chicago packing plants, the Western and the Independent, as well as other packing projects, the aggregate of all involving the expenditure of nearly $2,000,000. He will be a large buyer of machinery used in the packing industries.

The Illinois Steel Company, Chicago, is buying additional punches, shears and other tools to double the present beam yard equipment at its North works.

The Acme Harvesting Machine Company, Peoria, Ill., a reorganization of the defunct Acme Harvester Company, will shortly require extensive additions to its shop equipment. The reorganized company is capitalized for $2,000,000, fully paid in, and is backed by the First National Bank, Chicago, and other responsible financial interests.

The Union Iron Works, Houston, Texas, is in the market for modern machinery for manufacturing sash weights and cast iron washers.

The Grand Rapids Plow & Implement Company, Grand Rapids, Mich., a new concern, will require a complete equipment of machines and tools for the manufacture of disk plows and other implements.

The Sioux Falls Plow Company, Sioux Falls, S. D., will be in the market shortly for a fair sized factory equipment.

The Capital Foundry, Joseph Farris, proprietor, Springfield, Ill., is constructing a small jobbing machine and pattern shop, 24 x 100 feet. The pattern shop will be equipped with power pattern tools and the machine end of the building with drill press, planer, lathe, shaper, blacksmith forge and possibly a steam hammer. Mr. Farris expects to procure this equipment second hand.

John Wunder, Minneapolis, Minn., has been awarded a contract to build a new paper mill at St. Cloud, Minn., to cost $200,000.

The Parsons Band Cutter & Self Feeder Company, Newton, Iowa, expects to increase its factory capacity, but has not yet decided what building will be done.

T. J. Buckley, Town Clerk, Morton Park, Ill., will receive bids until August 31 on two 50 horse-power and one 15 horse-power gasoline engines, two double acting triplex power pumps, capable of pumping 770 gallons of water per minute each, and one suction tank.

The Georgetown Electric Company, W. H. Schaefer, superintendent, Georgetown, Ill., is in the market for ice machinery and wishes estimates from manufacturers.

The town of Huntington, Ind., will shortly ask for proposals on an air compressor to furnish 800 to 1000 cubic feet of free air per minute, the compressor to be installed in connection with the water works plant. George W. Sturtevant, Fisher Building, Chicago, engineer in charge, will receive bids.

The Loupe River, Neb., irrigation and water power project, referred to previously in these columns, is assuming much larger proportions than were at first proposed. It has now reached a status where 30,000 to 40,000 horsepower will be developed at a cost of several million dollars.

A levee district has been created in Scott and Pike counties, Ill., in compliance with State law. About 12,000 acres of land along the Illinois River is to be protected. Boilers, engines, centrifugal pumps and materials for constructing dikes, &c., will be required. C. H. Condit, Winchester, Ill., can give information.

James Leffel & Co., Springfield, Ohio, have been awarded the contract for the hydraulic equipment on the Fox River at South Elgin (Clintonville), Ill. The plant will include a 56-inch turbine water wheel, besides necessary shafts, gates, &c. George W. Sturtevant, Fisher Building, Chicago, is engineer in charge.

Bids will be received by S. M. McCowan, Chilocco, Okla., until August 31 for furnishing one 200 horse-power boiler, one 50 horse-power boiler and one 460 horse-power feed water heater to be used at the Indian School at that place.

Sealed proposals will be received at the United States Engineer's Office, Custom House, St. Louis, Mo., until September 8 for furnishing two double suction centrifugal type dredging pumps for 20-inch suctions and 28-inch discharge, two cast iron pillow blocks and two cast iron girders or tie beams for each pump, and 24 sections of discharge pipe, each 30 feet long and fitted at the ends with cast steel flanges.

Cincinnati Machinery Market.

CINCINNATI, OHIO, August 22, 1905.

For this season of the year business is exceptionally good and the shops are taken care of so far as orders are concerned for some time to come. What trade is coming forward is moving along quiet lines and there is an absence of the spasmodic flurries that are often noticed at certain seasons of the year. The foreign element in trade is steadily increasing and applies generally to distant points, with the possible exception of Russia. Several of the larger engine builders report large gains in orders, and as they are usually the first to feel the quickening impulse it is anticipated that an increased wave of activity will soon follow for general machine tools. The city is now experiencing the largest building boom in its history. The records show that for the first six months of the year the estimated cost of new improvements will be about $6,000,000, or $1,000,000 a month. The strike among the employees of the American Bridge Company is not felt here specially and the local company reports business booming. An immense amount of structural material is being used, one building now being erected at Fourth and Elm streets consuming about 3300 tons. To facilitate the handling of rapidly increasing business several of the large trunk lines of railroads are increasing their terminals. The Cincinnati Southern will construct a large viaduct extending from the bridge at Eighth street to Third and Front streets. The Louisville & Nashville is also contemplating large overhead connections, all of which will consume an immense amount of structural material.

Cincinnati was well represented at the reciprocity convention held in Chicago last week. President William Lodge of the National Machine Tool Builders' Association made a report to his organization in which he said: "I am pleased to report that nothing of a very radical nature was advanced and that the principle of protection as a national policy was continually spoken of and incorporated in the proceedings of the convention. I have no doubt that the National Machine Tool Builders' Association will be asked by the permanent Committee on Organization to become members of the Reciprocity Association, and I thoroughly believe that the men in whose hands this matter now is will carefully avoid anything that would tend toward national disaster and incorporate only such modifications as will result in the general good of all concerned and the whole people of the United States."

The Cincinnati Punch & Shear Company reports a heavy increase in orders during the last ten days. This is in the main largely local and has been greatly augmented by work on some special machinery. It is shipping a large double punch for railroad shops in Maine, large heavy roll for boiler shop equipment in Texas, five heavy machines for Honhorst & Co., this city; also large punch for punching 1½-inch hole through 1-inch steel for the Baltimore & Ohio Railroad shops in Baltimore. August is said to be to date the best month in the way of new business for the past 18 months.

The A. Streit Machine Company is devoting itself exclusively for the present to the manufacture of 25 horsepower upright and 16 horse-power opposed gasoline engines for automobiles. It expects to increase the capacity of its shop as rapidly as circumstances permit. It has added two Brown & Sharpe millers and a Hamilton engine lathe, and will further add two 16 or 18 inch lathes in the near future.

The Queen City Machine Tool Company reports an increased demand for its 24-inch shaper, all from domestic sources. It is about putting on the market a new 20-inch machine, which is expected to prove attractive to the trade.

Sealed bids will be received at the office of John I. Beelman, Clerk of the Board of Public Affairs of Portsmouth, Ohio, until 12 o'clock noon, August 28, for the installation of machinery and equipment necessary in the electric and water plant.

Philadelphia Machinery Market.

PHILADELPHIA, PA., August 22, 1905.

A fair volume of new business has been transacted in the local machinery market during the past week. Machinery merchants and dealers in second-hand engines and boilers note an increase in the demand, and while sales have not been heavy, enough have been made to give the market a much better tone. The greater portion of the trade, however, continues rather inactive; the same conditions which have been dominant during the past two months are still in evidence and it is hardly expected that any great rush of business will develop until early next month, about which time a general resumption is anticipated.

There has been a little more buying on the part of the railroad companies, but while the lists have been small, frequently covering some three or four tools only, this is quite desirable business, inasmuch as it closes promptly and as a rule is subject to prompt delivery. Extensive lists are expected from some of the leading roads in this territory at an early date. The market is, on the whole, governed to a large extent by the prospects for business in the future, and as they are favorable for heavy purchases during the fall, the tone of the market is strong and buoyant.

Manufacturers keep fairly busy on all general lines. Some have more work than they can conveniently handle. In some cases the respite is being taken advantage of by manufacturers to make up stock which will no doubt be required for prompt shipments when the fall business opens up.

The foreign demand varies but little. There was a slight improvement a few weeks ago, but it has dropped back again into a quiet market. Manufacturers doing a regular export business note about the same number of orders, but quantities are frequently reduced.

The foundries keep busy. Steel casting plants are being taxed in some instances to get out orders promptly, while gray iron foundries vary in point of activity and there is considerable competition on desirable classes of work.

The Philadelphia Rapid Transit Company has started operations on its two-story power station, previous mention of which was made in these columns. The building covers five lots, 812-820 Sansom street, and measures 104 x 108 feet.

The contract for the new plant of the Penn Reduction Company, which concern recently obtained the contract for the collection of the garbage of the city of Philadelphia during 1906, has been awarded by that company to Henderson & Co., Limited, contractors of this city. The Penn Reduction Company has been incorporated with a capital of $500,000, the incorporators being E. A. Paterson, T. S. Laudenback, Lewis Moore, M. E. Gibson, G. E. Goldbeck and Thomas Pyle.

Railroad Improvements.

The Pennsylvania Railroad has begun work on a one-story machine shop, 50 x 120 feet; a round house, 90 x 208 feet; a two-story bunk house, 37 x 57 feet; a one-story power house, 42 x 51 feet; a one-story oil house, 27 x 24 feet, and a lavatory, 20 x 23 feet, on ground adjoining the Gray's Ferry Yard, in this city. All the buildings are to be of brick.

The E. H. Mumford Company, manufacturer of molding machines, has taken the sole agency for the Beckwith multiple molding process, particularly applicable to the stove foundry business. This company notes an improved demand for its molding machines, particularly of the jar ramming type for deep flask work. A number of power ramming machines have also been sold, deliveries on which are being made as fast as they can be turned out. Shipment has been made of two large hand ramming stripping plate machines with power draft.

The Espen-Lucas Machine Works keep fairly busy. Inquiries are numerous and a large amount of business is on its order books. Some recent deliveries include a large horizontal floor boring milling and drilling machine for parties in New England. A number of cold saw cutting off machines have also been shipped, among which were three I-beam machines and saw grinders for local and nearby parties.

The Energy Elevator Company notes a good volume of business particularly from out of town sources. The company considers the outlook for the elevator business very bright and looks forward to a heavy trade during the balance of the year. Among recent deliveries made was a safety elevator for export to Belgium, a heavy freight lift for the Iver Johnson's Arms & Cycle Works, Fitchburg, Mass., and a power foundry lift for the Armstrong Stove & Mfg. Company, Perryville, Md. Freight elevators of various styles have also been delivered parties in McGrange, Ga.; Yonkers, N. Y.; Edgewater Park, N. J.; Little Rock, Ark., and Hudson, N. Y.

The Betts Machine Company, Wilmington, Del., is running at full capacity, part of the shop being operated on double turn. Conditions with the firm are very satisfactory and look favorable for continuation. This company has shipped two large planers and two 24-inch slotters to the different shops of the Southern Pacific Railroad Company in California, a 24-inch slotter to the Missouri Pacific shops at Sedalia, Mo., and one to the United States Navy Yard at Brooklyn, N. Y. An 8-foot boring mill is building for the Union Pacific Railroad shops at Omaha, Neb., as is one of the same type for the Isthmian Canal Commission at Colon. A 7-foot boring mill and an 18-inch slotter are being built for the Soo Line shops at Minneapolis, Minn., and four motor driven boring mills are under way for Japan, some for the Government works at Kobé. One of the mills will weigh over 100,000 pounds. An order for four heavy planing machines has also been received from the Baldwin Locomotive Works, Philadelphia, Pa.

The Hilles & Jones Company, Wilmington, Del., advises that conditions are very favorable. Its foundry department is busy on a large tonnage of work, while the machine tool department has a number of tools in course of construction for boiler shops, structural shops and railroads, among these being the machinery equipment for the new plant of the McClintic-Marshall Construction Company, Rankin, Pa., and heavy horizontal and vertical punches and shears for the Union Pacific Railroad Company.

Cleveland Machinery Market.

CLEVELAND, OHIO, August 22, 1905.

Machinery dealers and builders reported a slight falling off in business the early part of the month, doubtless due to vacation season, but now things are moving as lively as ever. Dealers report that this will prove one of the best months of the year, and some of them feel that it will show the heaviest sales. The great difficulty is in securing prompt deliveries. Those handling Cincinnati tools say they cannot make deliveries in 60 to 90 days, and in some lines a longer time is required. One dealer reported that cancellations of orders due to inability to deliver ran up to a good many thousands of dollars in the past few weeks. As has been the rule for some months back the great majority of orders seem to be in the nature of additional equipments rather than for lots of tools for new concerns. The automobile industry continues to furnish new business for the dealers here. Concerns that have been planning for extensions for next year are now planning to make still greater improvements, while a number of new concerns are springing up. Some of the announcements in this line will furnish good business for machinery dealers in the near future.

The Peerless Motor Car Company has a large factory extension under way and is now planning for another building. It will concentrate its work at one place instead of having it scattered and done by jobbing work as in the past, and its output will be practically doubled.

The Baker Motor Vehicle Company, which, as stated some weeks ago, is starting work on a new plant on the West Side adjoining the plant of the American Ball Bearings Company, with which it is closely affiliated, has decided to enlarge on the original plans, giving the plant 140,000 square feet of floor space. A power house will be erected and a 400 horse-power electrical unit will be installed. All machinery will be driven by motors, and a sprinkler system is to be installed. The investment for this plant will be about $400,000.

The Winton Motor Carriage Company, which produced close to 1500 automobiles this year, is planning for further extensions, and has been buying quite a lot of new machinery during the past week or two.

The Royal Motor Car Company is also making purchases of tools, and will erect an extension.

The Gaeth Automobile Company, heretofore engaged in the business in a small way, has secured additional backing, and will put up quite a good sized plant, installing a complete equipment of machinery.

The Forest City Motor Car Company is having plans prepared for a new factory building to build small gasoline cars to sell at a low price.

The White Sewing Machine Company will delay until next spring the actual construction work on its new factory which is to be one of the largest automobile plants in the world, the preliminary plans providing for about 600,000 square feet of floor space. There will be a brass and iron foundry, power house and boiler plant in addition to extensive machine shops.

The Colonial Brass Company, Cleveland, has secured the plant of the Geneva Automobile Company, Geneva, and is overhauling it. A modern brass foundry will be installed, including ten large furnaces. The Cleveland plant will be removed there with the present equipment of the plant and new brass working machinery which will be bought. It will be one of the largest plants in the country for the production of brass goods, faucets and plumbers' supplies. The plant will probably be in operation about October 1. The offices of the company will remain in Cleveland.

C. F. Schweinfurth, Cleveland, is engineer for new buildings to be erected for the Massillon City Hospital, Massillon, Ohio. A power house will be installed, including engines and

boilers, lighting and heating apparatus. The buildings will be of steel.

The D. Connelly Boiler Company has been incorporated, with $100,000 capital, by D. Connelly, C. E. Shaffer, W. C. Connelly, L. E. Connelly and Kate Connelly. The company succeeds to the business of the Cleveland Steam Boiler Works. The concern has been making extensive improvements of late, including the installation of a large compressor outfit, riveters, bending rolls, &c. It is now equipped to build boilers up to the largest size.

The Brown Hoisting Machinery Company notes a pronounced increase in the demand for locomotive cranes of all sizes. These are rapidly coming into use in industrial establishments and the sales during the past few months have increased 50 per cent. The company is busy in all departments and has a large amount of marine work on hand.

Railroad Purchases.

Railroads have been buying considerable machinery of late. The Toledo, St. Louis & Western has been buying some tools from local people for its shops at Frankfort, Ind., while the Pennsylvania Company, which has been figuring for a long time on a large list of machinery for its Dennison, Columbus and Indianapolis shops, has placed some of the orders and it is undertood will buy more in the near future. Announcement has been made that the Baltimore & Ohio has finally decided to rebuild the shops at Lorain which were destroyed some time ago and that the improvements at that point will aggregate $150,000. The Erie Railroad has placed a contract for the erection of a large machine shop at Willson avenue, but it is understood that but little new machinery will be required, as that in the old shop will be utilized.

Shipbuilding on the lakes is again showing pronounced activity. It has been understood that orders which have been in sight for some time have been held up owing to inability to secure guaranteed deliveries on the structural material necessary. Evidently this difficulty is now being overcome, because new contracts are being placed for 1906 delivery. Last week the American Shipbuilding Company closed contracts for two 10,000-ton steamers. The first order was placed by Wm. A. and Arthur H. Hawgood of this city. The vessel will be 545 feet long, 55 feet beam and 31 feet deep, and will have triple expansion engines and two Scotch boilers. The other vessel was ordered by L. C. Smith and H. S. Wilkinson of Syracuse, who are identified with the United States Transportation Company. This vessel will be of the largest size, 569 feet long, 56 feet beam and 31 feet deep. She will also have triple expansion engines and Scotch boilers. This makes 14 vessels which the local company has under contract for next year's delivery, all of them being over 500 feet long. J. W. Ellsworth, a Cleveland coal dealer, has ordered from the Great Lakes Engineering Works, Detroit, a car ferry steamer which will be one of the largest on the lakes. She will have a capacity for ferrying 30 50-ton hopper cars on deck and will be capable of running practically the entire year. She will have power sufficient to force a channel through the heaviest ice that forms on Lake Erie and will be considerably heavier than similar boats now on that lake.

The Toledo Machine Tool Company, Toledo, is having plans prepared for a new pattern storage and machine shop measuring 100 x 150 feet. It will be one story at present, but will be designed for three additional floors.

The Toledo Boiler Works Company, Toledo, has been incorporated with $100,000 capital by D. D. Flanner, A. M. Chesbrough, W. F. Day, E. W. Newton and J. H. Wagenhorst. The company succeeds to the business of the Toledo Boiler Works. The plant at Cleveland and Michigan streets will be improved.

The Central Heating & Light Company, Toledo, which is headed by Charles S. Ashley, is planning to double the capacity of its lighting plant. It will install new engines, generators and boilers, and will change the lighting system to the three-wire system.

The Toledo Gas, Electric & Heating Company, recently formed by the consolidation of several lighting and heating companies, has been organized with W. F. Robinson, president, and L. B. Beckwith, secretary, and capitalized at $2,500,000. The company is preparing to erect a large power station on the East Side. The equipment will include one 400-kw. turbine unit and three 1000-kw. turbines. A portion of the equipment has been contracted for.

The Holding Heater Company, Toledo, has been incorporated with $50,000 capital stock by C. V. Wagner, C. B. Holding, R. G. Manning, R. H. Finch and others. The company expects to erect a plant in Toledo to manufacture a gas heating stove, the invention of C. B. Holding.

The Water Works Department of Fredericktown, Ohio, is advertising for bids on equipment for a village water works after plans prepared by Thomas H. Cureton, Columbus.

The village of Plymouth, Ohio, is advertising for proposals for furnishing machinery and equipment for a village electric light and water works, gas engines to be used for power. John I. Beelman is clerk.

The Bruner Steel Wagon Company, Wapakoneta, Ohio, will erect a two-story brick factory building 60 x 100 feet. Work will start at once.

The H. H. Sturtevant Company, Zanesville, Ohio, will build a power house 45 x 75 feet and will install a 200 horse-power boiler and engine, together with generator and lighting apparatus.

The Ætna Foundry & Machine Company, Warren, Ohio, will erect an addition to its main building and will install additional machinery in its machine shop and foundry.

The Twentieth Century Heating & Ventilating Company, Akron, Ohio, which has recently acquired the factory formerly occupied by the People's Hard Rubber Company, is preparing to erect a foundry building 80 x 300 feet. It will be used in the production of steam and hot water heaters.

The property of the Findlay Axe & Tool Company, Findlay, has been acquired by Toledo, Columbus and Findlay people represented by O. M. Blake. The new company will spend $100,000 in making needed improvements and extensions.

The Bucyrus Steel Casting Company, Bucyrus, which was recently incorporated for $100,000 by W. A. Blicke, P. J. Carroll, Geo. Donnenworth, R. V. Sears and others, has secured a site at North Bucyrus and will commence the erection of a large plant to produce steel castings. It is the intention to complete it by November 1.

The Scoville Check Valve Company, Ashtabula, recently incorporated with $20,000 capital stock, will erect a plant to manufacture a self grinding valve for use on steam boilers, the invention of G. L. Scoville of Ashtabula.

Government Purchases.

The Bureau of Supplies of the Navy Department, Washington, D. C., will receive until September 19 proposals to furnish the navy yards at Boston, Mass.; New York; Annapolis; Norfolk, Va.; Pensacola, Fla., and New Orleans with machine tools as follows: Locomotives, water tube steam boilers, radial drill, lathes, lathe chucks, punch and shear, bolt cutter, bench grinder, tenoning machine, mortiser, electric hoist and runway, slotting machines, band saw, keyseating machine, engines, lathes and bench grinder.

Proposals will be received at the Bureau of Supplies and Accounts, Washington, D. C., until October 3 for a quantity of machine tools to be furnished to the Mare Island Navy Yard. The specifications include roll machines, lathes, drills, grinder, crane, furnace, &c.

Laffitte Welding Plate Tests.

In the issue of *The Iron Age* for May 11 the use was illustrated and the application was described of the Laffitte welding plate used for welding iron and steel. Since that time some very interesting experiments have been officially conducted with this welding material as compared with a prominent welding compound at the Government arsenal at Toulon, France, the results of which are given, as follows:

	Tensile strength.—Pounds.			Elongation.—Per cent.		
Material used.	Bar before welding.	Welded with compound.	Welded with Laffitte plate.	Bar before welding.	Welded with compound.	Welded with Laffitte plate.
Iron on iron	48,700	44,729	48,938	16.33	9.66	14.33
Iron on soft steel	48,700	43,964	45,631	16.33	4.00	4.00
Steel on soft steel	75,335	72,197	80,500	2.00	1.00	2.00
Iron on cast steel	75,935	43,719	48,692	2.00	3.25	9.05
Cast steel on cast steel	95,030	92,712	102,711	5.62	3.00	5.00

It will be noted that while the metal welded maintained its original tensile strength in all but one case it increased in strength in three out of the five tests. The elongation showed greater variation, in some cases being materially reduced, while in others it was practically unchanged, and in the case of welding iron on cast steel materially increased. These tests were made principally with a view of ascertaining the value of these plates in welding steel castings, such as locomotive driving wheels, locomotive frames, &c. The results obtained were highly satisfactory. The F. R. Phillips & Sons Company, Pennsylvania Building, Philadelphia, Pa., is sole American agent for these plates and is actively extending their use in this country.

The Crucible Steel Company of America, Pittsburgh, is making arrangements to establish agencies in Japan, Korea, Manchuria and the Far East for the sale of its crucible and other fine grades of steel in those countries. The company will establish headquarters in Tokio and will endeavor to expand its export trade and take advantage of the expected revival in commerce throughout Japan, China and the Far East.

HARDWARE.

RAPID recovery from trade depression has been a noteworthy feature of the recent history of this country. Yet the panic of 1893 and the three dismal years which followed it made such a deep impression upon business men that they have since been prone to take alarm at every indication of a falling off in demand and to imagine that another period of slack demand, profitless prices and business failures is imminent. It is hard for those who had a severe experience in those trying times to feel confidence in the business situation and to believe that such cessations of demand as are felt from time to time are casual and will soon give way to satisfactory activity. This lack of faith in the soundness of the conditions upon which the business fabric of the country rests seems unreasonable when the situation is studied. Conditions which actively promote general business are a steady increase in population, creative and productive energy and the accumulation of wealth. These factors in business development are exceptionally operative in the United States. The population of the country is increasing at a much greater rate than that which obtains in the rest of the world. The creative and productive energy of the people is the admiration of other nations. No other country is accumulating wealth so rapidly. These three conditions, apart from other influences which might be enumerated, justify great faith in the future. Sometimes it appears that production has overtaken consumption and that the country's growth has been so far exceeded that years may be required to bring about a normal balance. But unless a financial cataclysm is precipitated, with its invariable sequence of commercial timidity, the demand surprisingly catches up with the supply and it is seen that the apparently excessive producing capacity was really needed.

Taking a staple article of Hardware as an example, the production of Nails shows strikingly the effect of the increase in population and wealth. Going back to 1870, which is as far for this purpose as necessary, it is found that the annual output of Nails was at that time at the rate of about 4,000,000 kegs. The population in 1870 was in round numbers 38,500,000. The consumption of Nails was therefore at the rate of about one keg to nearly ten persons. In 1880 the population was about 50,000,000, and the yearly production of Nails had risen to 5,370,512 kegs in that year, or at the rate of one keg to but little over nine persons. In 1890 the population showed an increase of 25 per cent. over that of 1880, amounting to about 62,500,000, while the annual production of Nails had grown over 60 per cent., or to 8,776,857 kegs, which was at the rate of one keg to seven persons. During that decade Wire Nails began to displace Cut Nails, but the aggregate of both kinds is taken in these figures. In 1900 the population showed an increase of 23 per cent. over 1890, rising to 75,700,000, while the output of Nails in 1901 (which is taken for comparison because special causes reduced the output in 1900) increased 30 per cent., reaching 11,346,062 kegs, equal to one keg to a little under seven persons. In 1904 the population was about 83,000,000, and the production was 13,210,023 kegs, or at the rate of about one keg to a little more than six persons. Thus it is seen that great as has been the increase in population in these 34 years the demand for Nails has grown in an even greater ratio. Whereas, in 1870 one keg was produced to nearly ten persons, in 1904, with a population a little over twice as great, the production had to be more than quadrupled to meet the increased requirements of the trade. It may be too much to expect that the needs of the country will ultimately so expand as to require an output of one keg to every two or three persons, but rapid progress is certainly being made in that direction. What is true of Nails is true of other staple articles. The steadily increasing requirements of such a country as ours compel constant productive expansion.

Condition of Trade.

The general market has held up very well during the summer, there being a noticeable absence of bargains which can usually be picked up in the dull period. The actual volume of business being transacted by Eastern trade is somewhat light, being made up largely of small orders to assort up stocks. This condition causes no uneasiness, as a restriction of business is always expected in August. A steady flow of orders has been a feature of the Western market for the past two months, and this continues. Numbers of inquiries are being received by the large trade in the East, and the outlook for a good business in the early fall seems most encouraging. Reports from various sections of the country indicate that retail merchants are not overstocked, and that the demand from consumers is large. Manufacturers are endeavoring to prepare themselves for the large business they expect in the early fall, and it is questioned whether they will be able to take care of all orders for immediate shipment. In some lines they are finding it difficult to obtain raw material fast enough to meet requirements. A car shortage is beginning to be apparent in some sections of the country, which will doubtless become greater with the movement of larger quantities of merchandise and crops. Questions which are interesting the trade in general are the probable prices which will be made by manufacturers of Steel Goods, Horseshoes, Screen Wire Cloth and Poultry Netting. Fever conditions in the South and reports of ruined crops from localities in that section are interfering with trade to some extent.

Chicago.

The same steady flow of business that has characterized the market for the last two months continues to prevail. As might be expected, the demand for fall goods increases with each week, and is now almost at its hight. A continuation of the favorable crop reports that have been of so much encouragement to the Hardware trade is dissipating any latent fears that may have been entertained by the retail trade at large, and is leading to a greater liberality in the execution of contracts for forward delivery, as well as increasing the volume of goods ordered immediately in stock. The weakness which has characterized the prices of Wire products is less pronounced and the feeling is gaining ground that prices will soon be advanced not only to the present official basis, which has been shaded from time to time, but to a figure above that. Consumption of Wire products of all kinds has recently been much heavier than usual, and had it not been for the large stocks prices would doubtless rule much higher to-day than they now do. This is particularly true of Wire Nails, but Cut Nails are included in the same category. It is not easy to explain how Wire Mills not having their own steel plants can buy Wire Rods at $32.50 a ton, Pittsburgh, and sell Smooth Fence Wire at $31 to $33 a ton, or for that matter how they can draw the Rods into Wire, fabricate the Wire into Nails and sell the Nails at a profit on the basis of $34 to $35 a ton after commissions are paid. Similarly it is difficult to understand how an independent Sheet mill can pay $25 to $25.50 a ton for Sheet Bars, and about 6 cents a pound for Spelter, and sell Black and Galvanized Sheets at anything like the present actual figures. By the same token it is not reasonable to suppose that makers of Wrought

Steel Pipe can continue to pay in the neighborhood of $30 a ton for Skelp and sell Pipe at the present basis, which nets them less than $36 a ton at the mill. From these comparisons of the cost of raw material and the selling price of finished products, it is not unreasonable to assume that selling prices must be advanced shortly unless the cost of raw materials is greatly lessened. Builders' Hardware is in as heavy demand as ever, particularly for medium and less expensve grades. Indications are that stocks of Nails in retail merchants' hands are very light, and in Chicago the jobbers' stocks are also down to as low a point as is desired at this season.

NOTES ON PRICES.

Wire Nails.—The demand is improving, showing an increase beyond that of July up to the same date. Some jobbers find that conservative estimates made last month for fall business will have to be doubled to meet the requirements of their customers. Manufacturers continue to restrict output, which has a beneficial effect upon the market, as did also the reaffirming of prices at the Cincinnati meeting this week. The upward trend of raw material prices naturally suggests the possibility of higher prices for finished Wire products. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....$1.80
Carloads to retailers..... 1.85

New York.—The demand keeps up unusually well for the season and current orders received are for prompt shipment. Retail merchants as well as jobbers have been carrying light stocks for some time in anticipation of a lull in demand, which has not yet arrived. Merchants are placing contract orders quite freely. Quotations are on the basis of $1.95 to $2 for small lots from store.

Chicago, by Telegraph.—Wire manufacturers held a meeting at Cincinnati on Tuesday of this week, at which a very large percentage of all the mills was represented. Prices were reaffirmed and reports from all sections of the country indicated a bright outlook for fall business. The prophesied advance in the price of Wire products following the precedent of past years may not come into effect until September or even October, if it does at all. The present policy of curtailment of output will be continued until stocks on hand in the country are well disposed of. Official prices are on the basis of $1.95 in car lots to jobbers, $2 in car lots to retailers, with 5 cents advance for less than car lots from mill. Price from jobbers' store in small lots is unchanged at $2 to $2.05, base.

Pittsburgh.—We can report a perceptible improvement in demand for Wire Nails, new orders this month being larger than for the corresponding period in July. The manufacturers are endeavoring to restrict output to meet actual demand, as far as possible. Prices are fairly strong on the basis of $1.80 in carloads, but this is sometimes shaded slightly to certain competitive points. We quote Wire Nails at $1.80 in carloads to jobbers, f.o.b. Pittsburgh, plus actual freight to point of delivery.

Cut Nails.—The last meeting of the Cut Nail Association adjourned not to meet until the latter part of September. Low prices doubtless have some effect upon the placing of contracts with mills, but demand is generally light. Quotations range from $1.60 to $1.65, base, for carload lots, f.o.b. maker's mill. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points west of these cities are held at about $1.70, base.

New York.—The market remains in an unchanged condition at this point. Demand is fair, with quotations for small lots from store on the basis of $1.90 to $1.95.

Chicago, by Telegraph.—While prices have not been actually advanced, the tone of the market is stronger and there is a likelihood that prices will be higher before they are lower. We quote to jobbers, f.o.b. Chicago, in car lots $1.75, base; retailers, car lots, $1.80, base; less than car lots from mill $1.90 base; small lots from store $2, base.

Pittsburgh.—Some mills report a fair amount of new tonnage being placed, but the demand generally is light. It is believed that prices on Cut Nails are about as low as they will go, and for this reason some in the trade are placing orders for forward shipment. We quote Cut Nails at $1.60 to $1.65, base, for carload lots, f.o.b. maker's mill. Iron Cut Nails are about $1.70 per keg in carload lots.

Barb Wire.—While there is not much improvement as yet in demand, the market shows increased strength as the result of the reaffirming of prices at the manufacturers' meeting and the continued curtailing of production. Quotations are unchanged, as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days.

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Chicago, by Telegraph.—Prices were reaffirmed at the Cincinnati meeting and the policy of continued curtailment of output will doubtless be carried out until its object is attained. Official prices are unchanged, as follows: Painted Wire, $2.10; Galvanized, $2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, $2.25; Galvanized, $2.55; Staples, Bright, in car lots to jobbers, $2.05; Galvanized, $2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—While the present demand is light, it is thought it will soon show betterment as all signs favor a large fall trade. Prices are fairly strong, being only slightly shaded and to certain points of delivery. The action of the mills in agreeing to maintain prices has had a good effect and has helped to sustain prices through the dull summer period. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Smooth Fence Wire.—The demand has set in from Fence manufacturers, and will probably increase in volume as the season progresses. The market is generally firm at the following quotations, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....$1.65
Retailers, carloads..... 1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—A good contracting movement is in evidence among makers of patented fencing and a large volume of business is being booked from this source. The general demand for Smooth Wire is good for this time of year. Official prices are unchanged on the basis of $1.80 for Annealed, car lots to jobbers, and $1.85 in car lots to retailers, with 5 cents advance for less than car lots and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—The rapid expansion of the fencing trade is serving to bring about a heavy demand for Fencing Wire, and the mills making this product are very busy, with excellent prospects for the future. Official prices are unchanged and are being generally maintained, only slight concessions being sometimes made to certain points to which some mills have the advantage of low freights. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....$1.65
Retailers, carloads..... 1.70

Sash Weights.—In the Eastern market a general price agreement is being maintained by manufacturers of Sash Weights, who quote $24 per ton in carload lots and $25 per ton in less than car lots. Western territory is an open one and Pittsburgh and Chicago manufacturers' prices have recently ranged from $18 to $18.50 per ton, while jobbers have been quoting $19 to $21. Manufacturers supplying territory tributary to Toledo, Cleveland, Indianapolis and St. Louis have been making

quotations ranging from $22 to $25 per ton. The Southern market has also been more or less irregular. Raw material is scarce and the price is advancing, so that the tendency in the future will be toward higher, rather than lower, prices for Sash Weights. Demand is generally very good, and the prospects are for a continuance of a satisfactory trade until the end of the season.

Coil Chain.—An advance has been made by manufacturers in the price of Coil Chain of 10 cents on all sizes except 3-16-inch, on which the advance is 50 cents per 100 pounds. The condition of the Chain market is referred to as being stronger than for some time.

Leather Belting, Etc.—There has been a recent advance in the price of Hides of 1½ cents and the market is still bullish. This has given an upward tendency to the price of Leather Belting, Cut Leather and Leather Lacing Sides, which have advanced from 5 to 10 per cent. The advance is attributed to heavy buying by harness makers, to the general large demand for all classes of leather and to the reported control of the United States Leather Company by one of the large packing concerns in the West. Indications point to a stiff and high market.

Cotton Goods.—Cotton Sash Cord and other Cotton Goods have undergone no price changes during the two weeks past. Demand continues heavy with a scarcity of goods, while the market is very firm.

Vitrified Sewer Pipe.—In the territory east of the west line of Indiana the Sewer Pipe and Fittings trade is practically controlled by the American Sewer Pipe Company of Pittsburgh, Pa. A standard list was adopted by Eastern and Western manufacturers December 19, 1901, which is still in use by Eastern makers. Discounts announced from that list in February, 1905, are yet in force. West of the west line of Indiana there is no arrangement as to territory or prices. The Western list which is there in force is lower than the one before referred to, and each manufacturer quotes such discounts as he may see fit. The general tone of the market is good, while demand throughout the country varies according to location from good to fair.

Bright Wire Goods.—The prices of Bright Wire Goods, which have ruled very low for many months, have not yet reflected to any extent the improvement noted in the general trade, although some of the most extreme quotations have been withdrawn. The volume of trade is pronounced especially good for this season of the year and manufacturers are uniformly busy; therefore the condition of the market cannot be said to arise from dearth of orders. On the other hand, if prosperity continues to spread and activity in other lines to increase it seems reasonable to suppose that a moderate advance is at least a possibility this fall. At present discounts of 90 and 30 to 90 and 40 per cent. are readily obtainable and there is something inside of this for larger buyers.

Axes and Hatchets.—Prices hold steady on a fair volume of trade, which is expected to increase somewhat during the present half year. Orders are referred to as not large, but appear to make up by their number what they lack in size. Members of the association express themselves as entirely satisfied with the situation, claiming to control 90 per cent. of the entire production, although this seems to be considerably in excess of the demand. There are reasons, however, for believing that outside manufacturers are getting their full share of the business at prices a little below those fixed by the association. Published quotations remain unchanged.

Carpet Sweepers.—Hardwaremen disposed to follow the modern tendency to broaden their line will be interested by the steady increase in the sale of Carpet Sweepers. While this commodity has not in the past been very generally stocked, it would seem that the Hardware store was one of the most natural sources of supply, and the relationship with this line of trade is emphasized by the fact that some Carpet Sweepers are now being made entirely of metal. On the present system of marketing they pay a satisfactory profit and manufacturers seem to be successful in maintaining uniform retail prices. Medium grades selling for $3 each cost $2 each, subject to rebates of 50 cents per dozen on 3 dozen, $1 per dozen on 5 dozen and $2 per dozen on 10 dozen, used annually on contract.

Conductor Pipe and Eaves Trough.—There has been no noteworthy change in the discounts and prices to the trade quoted by the National Conductor Pipe Association in the circular issued July 3. Steady to brisk demand consequent to a general activity in building is reported both by manufacturers and jobbers and a maintenance of prices at least on the present level is confidently expected. Outside manufacturers seem very little disposed to disturb the equilibrium of the market and it is predicted that the association will gain several new members at its next meeting.

Rope.—Manufacturers are not actually complaining of the amount of business received, but it is not of as large proportions as could be comfortably handled. The market continues irregular in so far as card prices are not usually obtained. General quotations on the basis of 7-16 inch diameter and larger are as follows: Pure Manila, 11½ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 cents per pound, the above figures being shaded ¼ to ½ cent per pound, according to seller and buyer.

Window Glass.—Under date of August 8 an official Window Glass price-list was issued by the National Asociation of Window Glass Manufacturers, as given herewith. The list price of AA and A quality Glass, both single and double strength, is advanced, but the list price of B quality, both single and double, remains the same as in the manufacturers' list of January 1, 1901, as is also the case with the extras.

American Window Glass.

Bracket. United inches.	Sizes.	Single. AA.	Single. A.	Single. B.	Double. AA.	Double. A.	Double. B.
25	6 x 8 to 10 x 15	25.25	21.00	19.00	33.50	29.50	26.50
34	11 x 14, 12 x 13 to 14 x 20	26.25	22.00	20.00	36.75	32.50	29.00
40	10 x 26 to 16 x 24	28.25	23.75	21.00	41.00	35.75	31.00
50	18 x 22, 20 x 20 to 20 x 30	29.50	25.00	22.00	44.00	38.75	34.50
54	15 x 36 to 24 x 30	30.50	25.75	22.50	45.25	40.00	35.00
60	26 x 28 to 24 x 36	31.50	27.25	23.25	46.25	41.00	35.50
70	26 x 34, 28 x 32, 30 x 30 to 30 x 40	33.50	30.25	25.25	49.25	44.00	38.00
80	32 x 38, 34 x 36 to 30 x 50	38.25	35.00	28.75	53.50	48.25	41.50
84	30 x 52 to 30 x 54	41.00	37.25	31.25	54.50	49.25	42.50
90	.....	...	....	....	57.75	52.50	46.00
94	.....	...	....	....	58.75	53.50	47.00
100	.....	...	....	....	69.25	63.00	56.00
105	.....	...	....	....	74.50	68.25	60.00
110	.....	...	....	....	83.00	76.75	68.00
115	.....	...	....	....	93.50	85.00	76.00
120	.....	...	....	....	110.25	99.75	90.00

An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes over 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket. All Glass 54 inches wide or wider, not making more than 116 united inches, will be charged in the 120 united inches bracket. Sizes above 120 united inches, $10 per box extra for every 5 inches.

No discounts applying to the new list have been announced and none is likely to be made until the wage scale for the coming fire is satisfactorily arranged. It is thought probable that discounts on the jobbers' list will be arranged to correspond with those of the manufacturers' list, at least temporarily, and that perhaps later a new jobbers' list may be issued. Very few Glass plants will start up on September 1, and it is probable that a general resumption of Glass making will not take place for some time. Local quotations are as follows: The first two brackets of B single, 90 and 10 per cent. discount; all B sizes above, 89 per cent. discount; all A sizes, 88 per cent. discount.

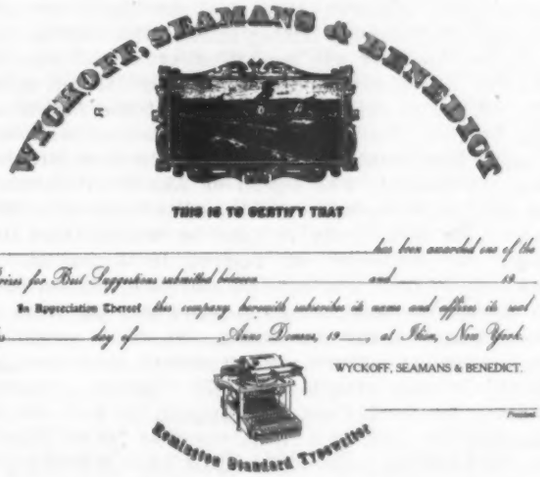
Linseed Oil.—Business is confined to orders for small lots for immediate delivery, covering current requirements. The views of large purchasers and crushers do not agree as to the price for contract orders. The market is firm, and New York quotations for prompt deliveries are as follows: City Raw, 54 to 55 cents per gallon; State and Western Raw, 52 to 53 cents per gallon, according to quantity.

Spirits Turpentine.—After various fluctuations in price, quotations at this point are the same as we gave last week. Business is fairly active. New York quotations, according to quantity, are as follows: Oil barrels, 63½ to 64 cents; machine made barrels, 64 to 64½ cents per gallon.

FACTORY COST AND BUSINESS METHODS.

ENCOURAGEMENT OF EMPLOYEES BY WYCKOFF, SEAMANS & BENEDICT.

WYCKOFF, SEAMANS & BENEDICT, manufacturers of the Remington Standard Typewriters, Ilion, N. Y., whose large establishment is operated under admirable business management, have an interesting bonus system for rewarding long and efficient service on the part of their employees. Like many other manufacturers with large plants where skilled labor is required they recognize the desirability of offering some definite and perhaps pecuniary incentive to diligence and faithful-



Framed Certificate of Award. (*Actual Size* 19 *x* 14 *Inches.*)

ness and some tangible inducement for their employees to remain with them. The following plan, which is regarded as working admirably, has been in operation about three years:

Badge System.

All employees in good standing whose connection with the company has remained unbroken for ten years are permitted to wear while they hold their positions a handsome service badge, one of which is illustrated herewith. The badges are marked in figures to distinguish between 10, 15, 20, 25 and 30 years' service. They are also recognizable by their enamel colorings, green, red, blue, yellow and lavender, respectively, and are much prized.

Bonus System.

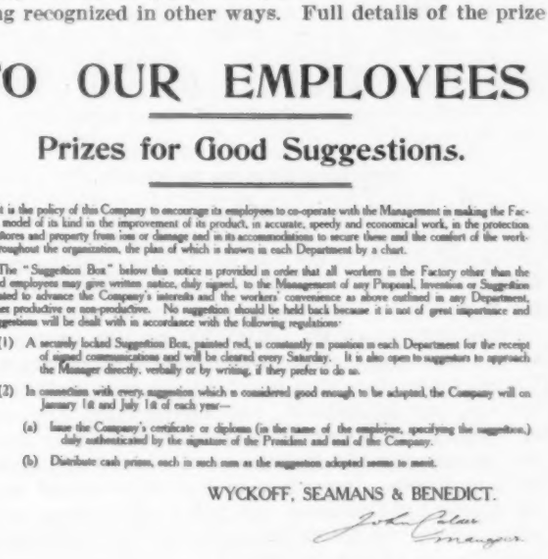
The badge is not merely a decoration, but every badge wearer is entitled to participate in the bonus distribution, which consists of $50 in gold per man semiannually

Ten-Year Service Badge.

($100 each per year), contingent upon loyal, diligent, efficient and uninterrupted service. The fifth semiannual bonus distribution took place in the office hall of the factory on June 30 last, when $11,450 was distributed among 229 employees. Of these 3 had served 30 years; 2, 25 years; 28, 20 years; 101, 15 years, and 95, 10 years. To attain a bonus award is the earnest aim of all badge wearers, who are naturally desirous also of having the same distinction at each semiannual distribution.

Prizes for Good Suggestions.

The badge and bonus systems are restricted in their application by length and general quality of service. In the prizes for good suggestions provision is made to encourage and reward thoughtfulness and ingenuity among all employees, including bonus recipients, salaried officials alone being excepted. The latter are expected in view of their compensation to give all their time and ability to the company, exceptional services from them being recognized in other ways. Full details of the prize



TO OUR EMPLOYEES

Prizes for Good Suggestions.

It is the policy of this Company to encourage its employees to co-operate with the Management in making the Factory a model of its kind in the improvement of its product, in accurate, speedy and economical work, in the protection of its stores and property from loss or damage and in its accommodations to secure these and the comfort of the workers throughout the organization, the plan of which is shown in each Department by a chart.

The "Suggestion Box" below this notice is provided in order that all workers in the Factory other than the salaried employees may give written notice, duly signed, to the Management of any Proposal, Invention or Suggestion calculated to advance the Company's interests and the workers' convenience as above outlined in any Department, whether productive or non-productive. No suggestion should be held back because it is not of great importance and all suggestions will be dealt with in accordance with the following regulations:

(1) A securely locked Suggestion Box, painted red, is constantly in position in each Department for the receipt of signed communications and will be cleared every Saturday. It is also open to suggestors to approach the Manager directly, verbally or by writing, if they prefer to do so.

(2) In connection with every suggestion which is considered good enough to be adopted, the Company will on January 1st and July 1st of each year—

(a) Issue the Company's certificate or diploma (in the name of the employee, specifying the suggestion,) duly authenticated by the signature of the President and seal of the Company.

(b) Distribute cash prizes, each in such sum as the suggestion adopted seems to merit.

WYCKOFF, SEAMANS & BENEDICT.

John Calder Manager

Announcement of Prizes for Good Suggestions. (*Actual Size* 15 *x* 11 *Inches.*)

system will be clear from the reduced *fac-similes* of the announcement and framed certificate of award shown herewith.

The good suggestions received range over a large field of labor, clerical, superintending and manual, and vary considerably in value. They embrace saving of material, utilization of wastes, substitution of machine for hand operations, improvement of manufacturing tools and fixtures, modifications in design of pieces to economize labor and time, new ideas in the line of the product, fire protection, sanitation, improvement of the system under which the factory is organized and operated and of the forms and routine involved.

All suggestions indicate, however, that the employees are working with their heads as well as their hands, and the publication of results tends to raise the intellectual interest of the whole force.

Baseball Park.

Great interest is taken by the company in the physical welfare of its employees, and special encouragement is offered to outdoor sports and exercise. Only recently a baseball and athletic park was fitted up, graded, &c., and formally tendered for the use of the Typewriter Baseball League, which is composed of teams from different departments of the works. Stands were built to accommodate 700, and as the field covers 15 acres it is amply large enough to supply all requirements of the employees in the way of a playground. The company believes in play and holds that those who work together should have an opportunity to play together. In order that the recreation shall be most beneficial it is so organized as to bring about the participation of the greatest possible number. Therefore no effort is made to create and support one skillful team merely to meet outsiders and supply amusement, but seven departmental teams contending among themselves, together with their substitutes and practicing followers, insure the sharing of a considerable amount of exercise and enjoyment throughout the works.

AMERICAN HARDWARE IN SIBERIA.

SEVERAL large shipments of Steel Rails and Hardware have recently been making their way by sea from Archangel to the mouth of the Yenisei River in the Kara Sea, from which point they are to be transshipped by river steamboat to Krasnoyarsk and thence by the Trans-Continental Railway to Irkutsk, Chita and various other points in Siberia. Whether the Japanese military and naval operations in the Gulf of Tartary shall leave Vladivostok in the possession of Russia or not, the Kara Sea route will in future constitute an important channel for heavy goods and slow freights to middle Siberia; and should Japan occupy and retain the eastern maritime provinces, which now seem wholly at her mercy, the Kara Sea route will remain the only channel for heavy freights (practically Iron, Steel, Agricultural Implements and Hardware) to middle Siberia. Such being the case, the Hardware trade to Russia is a subject well worthy the consideration of our merchants and manufacturers.

American Exports to Russia.

In the first place, it must be stated that the commerce and navigation tables issued by our Department of Commerce and Labor do not adequately represent the magnitude of this trade. According to Russian official accounts, the total annual importations into Russia at the present time amount to nearly 700,000,000 roubles (rouble 51½ cents), or say half that number of dollars, of which the United States furnishes about 10 per cent., or 70,000,000 roubles, say $35,000,000. The approximate correctness of these figures is beyond question, because they are the valuations upon which duties were exacted and actually paid in Russia. According to the tables issued by our Department of Commerce and Labor, the average annual exports from the United States to Russia at the present time do not exceed $17,500,000, say 35,000,000 roubles, which is scarcely 50 per cent. of the amount which the Russians acknowledge to have received into Russia from the United States. Now, while some small allowance may reasonably be made for American merchandise imported into Russia through other countries, this will not account for so great a discrepancy as is herein shown.

According to our official tables the reported exportations of American Hardware (only) to Russia in 1904 were as follows:

Agricultural Implements	$3,370,000	
Builders' Hardware	164,000	
Tools and Saws	92,000	
Scales and Balances	36,000	
Nails and Tacks	7,000	
		$3,669,000
The following may or may not be included in Hardware:		
Pumps	$80,000	
Cash Registers	35,000	
Firearms	15,000	
Laundry Machinery	9,000	
All other manufactures of Iron and Steel	37,000	
		176,000
Total Hardware		$3,845,000

If these reported exports amount to less than 50 per cent. of the actual shipments, then we exported last year to Russia about $7,500,000 or 15,000,000 roubles worth of Hardware. This agrees more nearly with the Russian figures. The total importations of Agricultural Implements and Hardware into Russia last year from all countries were about 37,000,000 roubles, not including machines or firearms, "Articles en metal a l'exception des machines." Small machines and firearms, excluding military weapons, would bring the total up to about 40,000,000 roubles. If the accounts of our consuls at St. Petersburg, Warsaw, Odessa and other principal points are to be depended upon, nearly one-half of this class of goods came from the United States, a substantial agreement between the two estimates, both of which appear to prove that our export statistics are faulty.

A Trade Worth Following Up.

Now $7,500,000 worth of annual trade (or even $3,845,000 worth) deserves some attention. A very large proportion of the Agricultural Implements will doubtless go, as heretofore, to the Baltic and Black Sea ports; but if the Kara Sea route can be depended upon for a single month during the year we may reasonably expect large orders from Siberia, a country with a good soil, splendid rivers, an immense railway, rich mines and 10,000,000 of inhabitants, but substantially destitute of modern Agricultural Implements and Hardware. Without going into any further detail, let it be remembered that Siberia produces annually $25,000,000 worth of gold. She is therefore abundantly able to pay for her importations. The only trouble is how to get them into the country without paying too much for transportation.

Data Concerning the Kara Sea Route.

The point to consider is therefore the practicability of the Kara Sea route. The several hundred carcases of woolly elephants and rhinosceroses which have been dug up from the Siberian tundras are a sufficient evidence that at some remote epoch Siberia was a somewhat warmer country than it is at present. As Malte-Brun very justly remarks, this does not imply any great change of climate, a trifling amelioration being quite sufficient to meet the conditions of animal life in a country where the reindeer and the camel still mingle. To effect this change the removal of the forests may alone suffice. The testimony of the classical writers assure us that within historical times the Kara Sea route was practicable. The legend of Abaris in Herodotus, of the Hyperboreans in Strabo, of the sailors in Pliny, who came from India to Gaul by way of the Arctic Sea; the testimony of Tacitus in Germania, and the story of Otto, who gave an account of his navigation to Alfred the Great, all go to prove that the Kara Sea route was formerly practicable. To these ancient examples we can add the modern ones of Johannsen, Nordenskjold and others. In 1878 Captain Johannsen rounded the North Cape, went through the Kara Sea and ascended the Lena in a steam vessel as far as Yakutsk. In the following year Nordenskjold made a similar voyage, and found a convenient harbor in the estuary of the Yenisei, which he called Dicksonhavn. During the eighties several successful trading voyages to Siberia were made by Norse and Irish skippers. In 1893 the Biscaya and Thule not only made this voyage successfully, but ascended the Yenisei to Krasnoyarsk without breaking bulk, and thus proved that Russia, even if she is driven from Vladivostok, has yet something of an outlet to the ocean for her great Eastern possession.

Short Season for Kara Sea Route.

But the Kara Sea route is open for only a month or two in midsummer and the trade has therefore to be so arranged that shipments shall accumulate at Archangel until the propitious season arrives for their voyage to the Kara Sea. Such arrangements involve the granting of credits to the Archangel merchants; a matter that in these days of commercial agencies and credit insurance companies should interpose no insuperable obstacle to the Yankee trader. Archangel, with a population of about 30,000, and quick communication with St. Petersburg, has a business season which lasts from June to October, but no American Consul, an omission that the reopening and importance of the Kara Sea route might render it advantageous for our Government to repair.

SIMMONS HARDWARE COMPANY'S TOLEDO HOUSE.

THE SIMMONS HARDWARE COMPANY, St. Louis, Mo., has arranged for the establishment of a branch house at Toledo, Ohio, the preliminaries having been completed for a corporation to be known as the Standart-Simmons Hardware Company. W. H. Standart, who until recently was manager of the Bostwick-Braun Company, will be local manager of the new concern. With Mr. Standart will be associated Daniel Segur, C. H. Russell and F. E. Moulton, all of whom were also with the Bostwick-Braun Company. The new company has a building under construction, on the completion of which a complete stock will be installed.

TRADE ITEMS.

THE EBBING MFG. COMPANY, successor to G. A. Milbradt & Co., St. Louis, Mo., manufactures the Milbradt Rolling Step Ladders and Tracks, the Ladders being made in various styles and sizes. The company makes the Ladders to measure rather than endeavoring to accumulate a stock sufficiently varied to meet every local requirement.

GEORGE P. HOBBS has severed his connection with the National Enameling & Stamping Company, of which he was New Orleans manager, and is organizing a company with New Orleans capital for the manufacture of stamped and pieced Tinware; $75,000 worth of the $100,000 stock has been subscribed, but the organization has been delayed because of the present health conditions at New Orleans.

THE Department of Commerce and Labor, Washington, desirous of securing the co-operation of manufacturers and other persons interested in the efforts being made by the Department, through the Bureau of Manufactures, to extend the foreign trade of the United States, is intending to establish a comprehensive card index which will enable the Department upon application to furnish useful information desired by manufacturers or intending purchasers. It is also contemplated to extend the system, if the necessary authority shall be granted by Congress, to the principal consulates. With a view to preparing this card index the bureau is sending out a blank in which particulars are requested from manufacturers as to product, capital, capacity, branch establishments, &c.

THE NEW YORK STATE ASSOCIATION OF RETAIL GROCERS, at its recent annual convention at Syracuse, adopted a resolution directing a protest to be sent to Congress against the enactment of the proposed parcels post.

THE ILLINOIS ASSOCIATION'S CONVENTION.

GUSTAV R. LOTT, 1002 West Lake street, Chicago, secretary of the Chicago Retail Hardware Association, which has charge of the preparation of quarters for the next annual meeting of the Illinois Retail Hardware Dealers' Association, advises us that up to date 20 of the exhibit spaces have been rented to manufacturers and jobbers. The convention will be held in the First Regiment Armory, Chicago, February 20, 21 and 22, and 134 spaces have been provided at $25 each for those who desire to make exhibits during the convention, which, it is expected, will be by far the largest in the history of the association.

AMONG THE HARDWARE TRADE.

S. F. & A. G. Herr, trading as the Beaver Hardware Company, at Beaver, Pa., have sold their business to T. L. Minesinger and S. J. Fair, who will continue under the same firm name.

The Reynolds Hardware Company, Davenport, Iowa, successor to S. M. Reynolds & Co., has incorporated with a capital of $15,000 to conduct a wholesale and retail business in Shelf Hardware, Tinware and Sporting Goods.

The Hardware, Cutlery, Paint and Farming Tool business owned by the Estate of Ellery B. Ring and conducted by it since Mr. Ring's death, five years ago, has been sold to Nutter & Foss, who have moved into a new store and will carry these lines in addition to Stoves and Plumbing.

The Lowe-Carter Hardware Company, Weatherford, Texas, has increased its capital stock to $120,000.

THE works of the Liggett Spring & Axle Company, Monongahela City, Pa., are again in charge of W. E. Marquis. The capacity of the already large plant has been doubled so that the company is in a position to turn out from 1200 to 1500 sets of Axles per day and from 400 to 500 tons of Springs per month.

MEETING CATALOGUE HOUSE COMPETITION.

A TRAVELING SALESMAN'S PAMPHLET.

AN interesting presentation of the question of catalogue house competition is given in a pamphlet recently issued by F. P. McCarty, a traveling salesman. The pamphlet is entitled "How to Meet Catalogue House Competition," and the purpose of the author in preparing it is referred to as follows:

> This little work is not gotten up with the object of attacking the dealer or retail merchant, nor is it gotten up to promote, defend or condemn the business of the catalogue house. Its sole object is to show how and why it is possible for a rank outsider to come into any locality and abstract the trade and cash from the friends whom we have known personally for years.

At the outset the author refers to the large number of merchants who have failed to give this form of competition the intelligent dissection to which it is entitled. They have simply permitted the catalogue houses to get business away from them without making a really earnest effort to hold it, some, in fact, "giving up the case as hopeless." Other merchants, however, of whom the writer knows or whom he has met have studied the question exhaustively. "They know all about it," he says; "they have solved it; they do not complain, for they have nothing to complain about." "Strange to say," he continues, "the methods of these successful merchants and the methods of the catalogue houses in the main are identical."

The author then gives suggestions, "inspired by the sayings of these successful merchants," as to "how to prevent catalogue or mail order houses from doing an extensive business" in any section at the expense of the local merchants, from which we extract the following:

> To begin with, the catalogue house is a corporation, composed of men who combine a certain amount of money in order to reap profit. It is safe to say that the men who conduct the catalogue business meet ever so often and devise ways and means to corral business. It is very evident that these meetings bring out one idea paramount to all others—that is
>
> ADVERTISING.
>
> Now the word advertising does not mean an expenditure of money in inserting cuts and other notices in newspapers. The word advertising in its broader sense simply means a way to reach the consumer so as to sell him wares. The catalogue house, from its name, believes the best way to reach the consumer is by and through catalogues. Therefore it is safe to assume that every catalogue house appropriates so much money each year for the getting up and distributing of catalogues. This item of expense must certainly be charged up on the books as advertising.
>
> THE CATALOGUE.
>
> After the catalogue is gotten up it must be sent somewhere. So a list of *your customers* is secured and a catalogue is sent to each. Now this is why the catalogue house is enabled to do business. It believes in and adopts modern ways of securing trade, and this is the whole secret of the success of the catalogue house being able to sell to your friends, for the catalogue house has what you have failed to get—that is, *a list of the buyers in your neighborhood.*
>
> Have you such a list? If not, are you really entitled to a big volume of business when you don't care to spend in your vicinity the same amount of time and money to get it that the catalogue house does? Can you expect to get something valuable for nothing? The catalogue house does not believe so, for it spends every spare minute of the day writing to your customers. Now if you don't believe in spending your spare time in trying to get trade why should you condemn those who do believe in working hard and who as a result of this hard work secure trade?

It is the catalogue that is sent out that does the harm, for if the catalogue was not sent out how could consumers ever know what the catalogue house had for sale, and if they didn't know what was for sale how could they ever buy?

Now is it reasonable to complain of the catalogue house? Just stop to figure it out for yourself. The catalogue fellow is doing exactly what you do. He has to buy his goods; so do you. He wants to sell them at a profit; so do you. He doesn't care who he sells them to; neither do you. The difference is, *he spends more money for advertising right in your own neighborhood than you do.* If you don't believe this just figure it out and then ask yourself, Do you spend as much money for advertising in proportion to your sales as the catalogue houses do in proportion to theirs?

PERCENTAGE OF EXPENSE.

As a good business man can you expect to do more business at a less percentage of expense than any other good business man? If you do it and can keep it up what is the use of complaining of the catalogue house at all? If you do complain of the catalogue house getting your business away from you the cause of the complaint is because you are trying to do a big and profitable business at a small expense, which cannot be done in these days of competition. The chances are that if some other good business man were to open up a store in your town and advertise his wares more than you do yours he would likewise get your trade away from you.

THE MATTER OF PRICE.

Some merchants who complain about the catalogue house and who have read the foregoing up to this point will keep repeating, "Price, price; they undersell us." Well, let us say to these merchants that a few years back, and before the catalogue house came so prominently in evidence, a certain St. Louis manufacturer, who knew what hustle and hard work meant in profit, sent carloads of Ranges right to your depot. He also beforehand got a list of your best customers and went right to them and sold your best friends $70 Ranges, which were not as good as the ones you asked $45 and $50 for. Now, suppose this St. Louis manufacturer, still possessing the same desire to sell your friends his great nonbreakable, hit-me-with-a-hatchet, Jesse James Range, had failed to get a list of your customers, or had failed to send men to see your customers, how many of his $70 Ranges would he have sold in your locality? Likewise, if the cataloguer of to-day had failed to get a list of your customers and had failed to send his salesman, the catalogue, to your customers, how many of his cheap or cut-in-three-part $70 Ranges would he sell?

Just a few years ago it was the complaint that a rank outsider sold your trade for twice the money you ask for your goods. Now it is the complaint that a rank outsider sells your trade for half the money you ask. Yet the whole secret of how he got the big price and of how he now gets the small price remains to a great number of merchants unsolved. The lesson of getting what we work for is not looked into at all. Yet here is the whole secret solved. It is not price, but simply good business practice that sells the catalogue's goods.

One of two facts must be true: Either the manufacturer who sells the retail merchant is securing an enormous profit from the high price he asks or he makes a better grade of goods and must necessarily get a bigger price for his goods, which better grade must bring a larger retail price than those sold by a catalogue house. We will leave this subject entirely to the dealer's judgment, for he knows that he buys a better grade of goods.

ADVERTISING IS THE KEYNOTE

of success. First, get a list of all the householders in your town and vicinity; then send them circulars, send them letters, send them prices, invite them to your store, advertise in the newspapers, keep your name before the public, sell good goods and get good prices. You can do it, but you cannot do it without advertising.

The author then presents a series of questions and answers in regard to catalogue house competition in the following synoptical form:

Questions Asked and Answered by the Catalogue House, by the Retailer Who Complains and by the Merchant Who Does Not Complain.

QUESTION.	*ANSWER By the Catalogue House.*	*ANSWER By 90 Per Cent. of Dealers in Retail Business.*	*ANSWER By 10 Per Cent. of Dealers in Retail Business.*
What business are you engaged in?	Buying merchandise as cheaply as possible and selling this merchandise at highest price obtainable.	Buying merchandise as cheaply as possible and selling this merchandise at highest price obtainable.	Buying merchandise as cheaply as possible and selling this merchandise at highest price obtainable.
What system do you adopt to dispose of profitably what you buy?	We try to reach every buying individual within a certain zone by catalogues and circulars calling attention to what we have for sale. If we failed in this we believe no buyer could possibly guess what we have for sale. Hence we could not do a very profitable business.	We keep our store open from seven in the morning until nine at night. Whenever customers come to our store we try to sell them what they ask for.	We do a great deal of advertising, because we find it pays. We have a mailing list and at all times send out circulars and cuts of goods in season. These circulars and cuts are in almost all cases furnished by the jobber or manufacturer whom we buy from.
How did you come to adopt your system?	(By the manager.) Before I helped to organize this company I was engaged in the retail business. I noticed that every mail brought a great number of cuts and catalogues from manufacturers who had made millions in their business. I concluded that if these successful business men could make money by spending such vast sums as they certainly must on postage, stationery and help to get their mail to the post office why couldn't I make more money by employing the same system, keeping the expense within my means. I tried the system and made money. Finally I thought it would pay fortunes were I to get to some big city and send cuts and circulars and even catalogues to every one, no matter where. I sold out my retail business and came here to Chicago and helped organize this company.	We believe that we understand this line of merchandising, for we have been at it a long time. Some one has to meet and sell the demands of the public.	If we knew that we could do as large and profitable a volume of business without advertising we would certainly quit advertising entirely, for the expense of advertising is very great. But it has been our experience that as soon as we cut our advertising we likewise cut our business and profits. Besides, it is our opinion, based on observation, that the people who do a big volume of business are extensive advertisers—it matters not if they are retailers, jobbers or manufacturers. Our system came to us through observing and adapting the systems employed by successful business men everywhere to our needs.

QUESTION.	*ANSWER By the Catalogue House.*	*ANSWER. By 90 Per Cent. of Dealers in Retail Business.*	*ANSWER. By 10 Per Cent. of Dealers in Retail Business.*
Do you find your system expensive or not?	Expenses never worry us as long as we do the business. As to whether we do the business, ask the retail merchant in any locality. He may tell you.	We keep our expense down as much as much as possible. We do most of our own work, but occasionally we have to employ an extra man during certain busy seasons. By keeping our expenses down we have managed to get together a little of the rainy-day medicine.	We find that it takes a certain expense of work or money to produce a dollar of profit. We have about concluded that we would rather spend $3 to produce $1.50 profit than we would to spend $1 to produce 75 cents of profit. The expense item does not worry us as long as we do the business, and it has proved itself to us in a dollar and cent way that to do a large and profitable business requires in proportion a large expense account.
What is the result of your system as far as getting trade and profit is concerned?	As for getting trade, our system works exceedingly well in some localities, but not so well in other localities. This, of course, is regulated entirely by how live the retailers are in any locality. Realizing that if the country merchant were to adopt our methods of doing business we could not do business in his locality in large enough volume to enable us to buy many articles in quantities, we have recently decided to keep our name off of all goods shipped out, so that the retailer visiting the railway station will not recognize the goods as coming from us, for we don't want to be known by the retailer in any locality as doing much business. If the retailer feels sure that we do a small business in his locality he takes life easier, leaving the work and the trade to us.	We make a living, but would be doing much better were it not for the catalogue house. It seems to us that the retail business dwindles each year. Stoves? Yes, we sell a few Stoves. It used to be that the peddler came here and sold trashy Ranges for $70. Now it is the catalogue house that sells Ranges for less than we can sell them. Mailing list? Yes, we sent a Paint house a list of names, but it didn't improve trade in the Paint or any other line. Besides, we haven't the time to fool away sending out letters that cost money, especially when we aren't sure of getting the money back. We are trying to see how little we must spend to get trade and not how largely we can run our expenses up.	We started in this business with very little capital, but by hustling and hard work we are now making money. We were strangers in this locality when we started up, but we had unlimited confidence in our ability to make a success. We never knew of any one coming to our door, throwing in money, and then running away. Our first aim was to get a reputation for fair dealing, but we had hard work in doing this. At first we used to take a rig and drive out in the country to see the trade. Our trade increased so that we couldn't spare the time to make these trips, so we adopted the system of sending quotations, circulars and even catalogues to these same people whom we used to visit in person. We are now using identically the same system as the catalogue house, except that we have the advantage of being able to show our goods before our customers make a purchase.
Do you buy your goods in such large quantities as to entitle you to prices such as enable you to undersell competition?	We buy about 25 per cent. of our goods, such as staple articles, in car or larger lots. For the other 75 per cent. of our purchases we send out men called house buyers, who go to the jobber or manufacturer. These house buyers buy only such articles as we have orders and the accompanying cash for. No; we do not buy more than 25 per cent. of our goods in large quantities, for if we bought everything shown in our catalogue in car lots we would have to build a warehouse to hold these goods, which warehouse would occupy a space larger in area than several Illinois counties.	The demand for goods from customers who come to our store for what they want is so limited in quantity that we cannot see our way clear to order in big quantities. If we could order staple articles in large quantities, as does the catalogue house, we could sell these staple articles for less than we do and thus cut down a lot of catalogue competition. However, we do know that, with the exception of staple articles we can sell as cheaply as do the catalogue houses. We do not hesitate to tell this fact to the people who come to our store, but somehow they manage to buy from the catalogue house just the same.	We know that staple articles are sold at a price that is regulated by the price we are enabled to buy them for. Therefore we spend a great deal of money in advertising how cheaply we can sell these staple articles. In this way we are enabled to sell big quantities of staple articles, which, in turn, enables us to buy large quantities at very low prices. We are certain that no one, not even a catalogue house, can afford to sell regular goods any less than we can. It is the staple articles that worry us, and it is this class of merchandise that we spend money in advertising, for the more we sell the more we can buy. The more we are enabled to buy the better price we can buy at. We aim to get the reputation of being the cheapest priced house in town. We get this reputation by selling 25 per cent. of our goods, or, say, the staple articles, which every purchaser knows the standard price on, for less than competition. We try to sell the staples for less money than competition by creating a demand, and are thus in a position to buy larger quantities, which means less price at cost.

AN ILLINOIS MERCHANT'S PROPOSITION.

J. F. SCHUBERT, Hardware merchant, Stockton, Ill., has issued a folder entitled "A Bold Announcement," in which he proclaims his purpose to meet the prices of catalogue houses and department stores in the large cities. "All we ask," he declares, addressing the consumer, is

> that you deal with us on the same basis that you deal with the catalogue houses, and give us the same amount of time to get the goods which it would require to order from them. Plank your money down when you order the goods and we will meet each and every price they make and furnish you the same goods at the same prices they offer you.

But Mr. Schubert "will go further," to the following effect:

> We don't ask you to take any goods where mistakes are made in ordering. We shoulder the mistakes. If you have ever had anything come wrong you know what a nice little job it is to get it corrected, no matter how willing the firm is to do it. It takes correspondence, stamps and freight on the goods to get them exchanged, to say nothing of the loss of time.

Asking if there is anything wrong with his proposition, Mr. Schubert touches on credit and its disadvantages and handicaps as follows, making the point that if the local resident will treat the local merchant as he does the catalogue house and pay cash for his purchases he will secure more satisfactory results:

> The whole trouble with our people about Stockton is the same with which so many communities are suffering, the old slow coach credit. Some of it is so slow we never get it. No merchant can sell goods cheap on that plan. The dollar invested in goods to-day and sold for

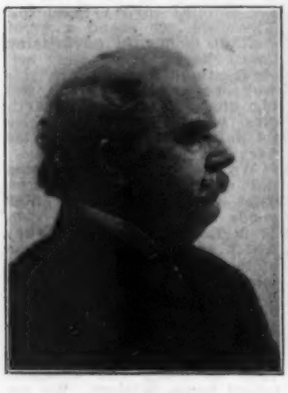
cash to-morrow can be invested in more goods the following day, and the same process of sale may be repeated. But the dollar invested in goods to-day and sold on credit to-morrow is tied up so long as you don't get it back, and its earning capacity is stopped for the merchant until he gets it back again.

Can you wonder why the catalogue house has the advantage in prices over most of your home merchants? The catalogue house won't trust you; even demands the money in advance with no goods in sight. Your home merchant often trusts you to his sorrow, even though 100 per cent. sometimes be his profit. Many times a seeming profit of 25 per cent. on goods sold to a good man turns out to be merely a small interest on the money invested because of slow pay.

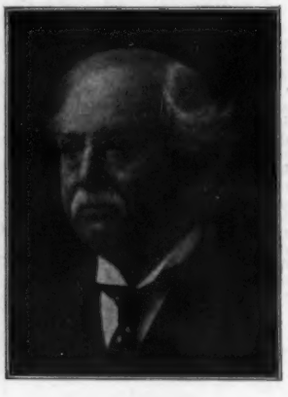
Treat your home merchant like you are compelled to treat your catalogue house and we think you will get better results.

ENTERTAINED MEMBERS OF THE MICHIGAN ASSOCIATION.

THE long established firm of Morley Bros., Saginaw, Mich., Hardware jobbers and manufacturers of Blue Line Lumbering Tools, Easy Rolling Step Ladders, Horse Collars, Harness, &c., made special arrangements for the entertainment of customers visiting the recent Hardware convention held in their city. Handsome cards were sent out in advance inviting visitors to make headquarters at their store, and the regular routine of business was made secondary to showing them attention. All the firm's travelers, numbering over 20, were called in for the week, and many of them did active service, especially T. J. Furlong, who was chairman of the Traveling Salesmen's Committee. R. C. Morley, the present active manager of the business, was a member of



E. W. MORLEY.



G. W. MORLEY.

the Executive, Finance and Reception committees, and with his brother, Paul Morley, gave an invitation luncheon at the East Saginaw Club on the second day of the convention. This house was established in 1863 by E. W. and G. W. Morley, whose portraits are herewith given, and both of whom are still actively connected with the business. G. W. Morley is president of Morley Bros. and also president of the Saginaw Second National Bank.

MITCHELL-POWERS HARDWARE COMPANY, Bristol, Va.-Tenn., has secured the services of R. M. Crumley, formerly buyer for the Barker Hardware Company of that city, who will take charge of the Mill Supply department which the Mitchell-Powers Company has decided to add to its other departments, including Hardware, Stoves, Tin and Enameled Ware, Railroad Supplies, Paints and Oils, Sash, Doors, Vehicles, &c. The company has leased two floors, 45 x 150 feet, adjoining its present office and salesrooms, 613-615 State street. Arches have been cut for connection with these rooms, and the latter are now being fitted up for the accommodation of a full line of up to date Mill and Miners' Supplies, and the company will be ready to supply the trade by September 1. These additional quarters give the company a floor space of about 100,000 square feet.

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Correspondence.

A TRAVELING SALESMAN'S VIEW OF SPECIAL BRANDS.

To the Editor: In your issue of July 20 I took pleasure in reading Mr. Simmons' communication in regard to jobbers' special brands. I have sold Hardware on the road for over 25 years, and speaking from experience I find that nine dealers out of every ten prefer manufacturers' brands. They prefer to know who makes the Shovel, the Saw, the Chisel, Auger Bit, Pocket Knife and, in fact, everything pertaining to the line they buy and sell. If they have a customer for a Hatchet, a mechanic who wants a first-class article, the dealer will recommend a tool made by a firm that has a reputation and guaranteed to be free of any imperfection. The manufacturer's stamp is on that Hatchet, Hammer, Saw or Chisel—it is not covered by a label to cover its identity.

In most instances the manufacturer of that tool began his "schooling" in a small shop and gradually became a manufacturer himself, and after years of toil gained a reputation in his line known to almost every dealer and consumer. His own brand means quality. Tack & Co., the jobbers, propose a special label of their own, and if this manufacturer will not make a tool with the imprint of Tack & Co.'s "Blue Coat" or "Diamond Steel," the other manufacturer will take the order—a manufacturer who is known to make cheaper goods.

The salesman on the road can claim that his firm's special brand Files are made by a certain manufacturer, knowing that the dealer prefers that brand. He will tell the next Hardware merchant that it is especially made up by another manufacturer of Files of known quality. The question is this: Who makes your File? I want to know who is who. Why do you cover the manufacturer's brand with a label of your own? Call a spade a spade. No reliable goods of known quality need a change in name to market them.

About 12 years ago my firm sent me a sample of a Hatchet, all steel and blue painted, made by a manufacturer of first-class tools only. I sold them to three men out of four and on the trip following they replenished their stock on that Hatchet, each customer well pleased with goods, prices and quality. Inside of six months several dealers substituted that Hatchet at about 10 per cent. less in cash, the same in finish and general appearance, but with a jobbers' special brand. Inside of 18 months three other jobbers had the same Hatchet—same in finish—and each salesman claimed that it was made by the manufacturer who first made the original. The jobber covered the (cheaper) quality of the original with a special label. It took about three years' time to prove to the dealer and mechanic that these cheaper Hatchets were simply cheaper goods and were not as good as the one sold with the manufacturer's brand. These special brands covered up the (poor) quality for the time being.

We are in business for money, and the jobber can invariably make a better profit on a special brand article, as there is no other tool of that brand on the market. There is no competition to the jobber on his own brand and the retail dealer must pay his price. The jobber, in order to start a certain dealer in a town on his own brand goods will promise to give him the exclusive sale on these goods; but I find in every town I visit that when they sell to three men out of four all three dealers have these special brands on their shelves, and when the retail dealer will not insist on a certain brand of Hatchet, Hammer, File, &c., he will always get the special brand.

Mr. Simmons is in business for the Simmons Hardware Company and he can make more money selling Keen Kutter goods than legitimate factory brand tools, &c., and he mentions the fact that if he tried to interest a new retail firm on Keen Kutter goods he certainly should give them the same privilege to introduce *their* special brand, as Mr. Simmons had in 1872, when he could not place an order for 1000 dozen Saws or 50,000 dozen Files.

If a jobber is a manufacturer also he should (in justice to himself) mention the line of goods he controls, same as other manufacturers do. With all due honor to Mr. Simmons and the great firm he represents, while the jobber may make his own goods, the manufacturer may also become a jobber and general distributer.

A HOOSIER TRAVELER.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM DAVIS & SON, Lowry City, Mo., successors to the Hardware business of Davis & Marlsley.

FROM M. J. GALLAGHER, Wheaton, Kan., who has purchased the Hardware, Harness and Furniture business formerly conducted by Bothe & Louis.

FROM FRAWLEY & Co., Waynoka, Okla., who have bought out the Hardware, Stove, Implement, Vehicle and Sporting Goods business of Murrow & Murrow.

FROM BERRY & HUDGINS, Memphis, Texas, retailers of Hardware, Agricultural Implements, &c.

FROM THE FRANKOVIZ HARDWARE COMPANY, Fergus Falls, Minn., which has recently incorporated with a capital of $50,000, and will at once erect a new brick block to accommodate its Hardware, Stove, Plumbing and Heating, Paint, Sporting Goods and Electrical Supply business.

FROM D. H. ROUSE, Lovilea, Iowa, successor to Castnor, Cole & Co.

FROM E. L. FOLK & Co., Woodstock, Va., jobbers of Hardware and Mill Supplies.

FROM JENSEN & YOUNG, Richfield, Utah, successors to the Hardware, Stove, Paint and Sporting Goods business formerly conducted by Meeter Bros.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

AVERY STAMPING COMPANY, Cleveland, Ohio: Advertising card, with color illustration and jingle referring to Never Break Seamless Stamped Steel Cooking Utensils.

F. E. MYERS & BRO., Ashland, Ohio: Points on Pumps. An illustrated pamphlet devoted to suggestions to salesmen and dealers with a view to familiarizing them with the firm's Pumps.

ADVANCE MACHINERY COMPANY, Toledo, Ohio: Catalogue of Copper Appliances for the glueroom, including Wetmore Patent Glue Heaters, Warmers, &c.

CRANE BROS., Westfield, Mass.: Price-list of Linenoid Seamless Specialties, such as Traveling Cases, Megaphones, Horns for talking machines, &c.

WHITE WAGON WORKS, Sheboygan Falls, Wis.: Catalogue, illustrated in colors, showing line of combined Coasting Wagons and Sleighs, with booklet of testimonials from dealers.

SIMMONS HARDWARE COMPANY, St. Louis, Mo.: Catalogue of fall Sporting Goods, including Guns, Ammunition, Hunters' Clothing, Football and Gymnasium Goods, Skates and Sleds; also catalogue of Lamps and Lamp Goods and Klear Krystal Chimneys.

GERSTENDORFER BROS., 231 East Forty-second street, New York: Handsome catalogue, including color samples of Decorative Specialties and Bronze Powders, Gold Enamel and Paint, Star Enamel and Sapolin Carriage Gloss Colors, Floor Stain, Varnish Stain, Stove Pipe Enamel, Aluminum Enamel, &c.

THE AMERICAN WRINGER COMPANY, 99 Chambers street, New York: Illustrated catalogue No. 8 of the line

of Horse Shoe Brand Wringers. In the production of the catalogue the object has been to make the book descriptive as well as attractive, in the interest of the merchant.

S. L. ALLEN & Co., 1107 Market street, Philadelphia, Pa.: Catalogue illustrative and descriptive of Flexible Flyer Sleds. These are made in six sizes to carry from one medium sized child to six grown persons.

MUTUAL INSURANCE.

EXTRACTS FROM AN ADDRESS MADE BY W. P. LEWIS, TREASURER OF THE NATIONAL MUTUAL INSURANCE COMPANY, HUNTINGDON, PA., AT THE RECENT CONVENTION OF THE MICHIGAN RETAIL HARDWARE ASSOCIATION.

In the growth of all State associations it was found that members demanded material evidence of the value of membership. It was pointed out, however, to them that they were making common cause; that they were learning to know each other better, thus developing the fraternal spirit; that there was the exchange of valuable ideas and the acquirement of money making information; that manufacturers and jobbers by reason of magnificent displays and personal attendance contributed greatly to the interest; that there were at every convention most attractive entertainments and outings. Any one of these, and certainly all of them, should be reason enough for every Hardware merchant in the State to apply for membership and to attend the conventions. But there were many merchants who when solicited for their application said it cost $4 to join, it cost railroad fare, it cost hotel bills; they could see no advantage, and so declined. The co-operative or mutual fire insurance idea came with distinct force.

HERE WAS A TANGIBLE ADVANTAGE

in membership. Every merchant must have fire insurance, and in the mutual company he could get $50 worth for, say, $30, the difference, $20, being sufficient to pay not only his dues, but possibly railroad fare and hotel bills. Or if it were inconvenient or impossible to attend, he would positively make $16 on a $4 investment in one year. But the rule was inexorable that he must be a member of the Hardware association to have the advantage of the insurance. It thus developed that mutual fire insurance was a power, because those who were in could make a little money on their insurance premiums and those who were out were interested sufficiently to come in that they, too, might participate.

PUBLIC OPINION

has been defined as the "stupidity of one multiplied by the stupidity of many." I quote this epigram but decline to indorse the sentiment. Personally I have the greatest respect for public opinion. Jumping to conclusions and haste may sometimes be charged against it, and sometimes it errs, but when it does it is chiefly because all the facts are not presented; but given all the facts, public opinion is as straight as an arrow to the mark. When the Michigan membership understand all the facts, understand the underlying principles, have the fullest confidence in the management, comprehend the possibilities of the plan and become men of action as it is in them to be, as their ancestors were, the result will be beyond criticism.

ON ITS MERITS.

The National Insurance Company solicits business on its merits. No policy holder who has suffered fire loss has any but sentiments of the warmest approval for its methods of business. The management is able, the officers are deeply interested in the company's welfare; they are ambitious for the company's future; they are keenly alive to every opportunity of development, and they have succeeded wonderfully.

The company was formally organized in August, 1903, just two years ago. The first policy was written in November, 1903. The business to date is about $1,000,000. There is absolutely no "graft" of any kind, large or small, and the salaries are petty. But the management is encouraged to believe that while some of the expected benefits from Hardware association effort may fade, grow dim and pass away, mutual fire insurance will loom larger and larger on the horizon of permanent achievement. Why should there be any hesitation in buying a policy in the National Company? Are you fearful of mutual insurance? The best flat insurance on earth to-day is that written on a class risk, with a limited policy, and Hardware is probably

THE BEST CLASS RISK.

Are you fearful of the mutual liability? The extreme mutual liability of a policy holder in the National Company is an amount equal to the original deposit or premium. It would take a conflagration that would sweep the State to call for the limit of this mutual liability. Are you fearful of the officers? They are under ample bond in the best guaranty companies. Men of Michigan, the National Mutual Insurance Company is organized on the best mutual plan known. Its officers are honest and competent. The field is large and ripe for a forward move.

CONFIDENT OPTIMISM.

The National Company should be made, can be made and will be made the greatest mutual company in the country. Pessimism discovered no country, developed no people, organized no enterprise, is always destructive. I urge you not to cast your lot with the herd of pessimists whose acute but petty minds see only difficulties and harbor always suspicions. Persistent optimism, persistent action and a few years of time will win for the Hardware merchants a great insurance company whose influence as an association builder can have no equal. The estimated dividend this year is 28 per cent. With awakened Michigan in the fore it will be 38 per cent.

THE RATIO OF FIRE LOSS.

Fire insurance has been a world institution for 350 years. 'Tis now a habit grafted on our civilization. 'Tis a good habit; in fact, an absolutely essential habit to commercial success. The figures from the stock companies show that there is one fire loss to every 27 policy holders, but keep clearly in mind that these stock companies insure every class of merchandise and by reason of this fact their ratio of fires to policy holders is 1 to 27. The National Mutual Hardware Company has had seven fires, two of which are not worthy of note, as the aggregate loss was under $10. Five of them, however, were normal fires, the loss ranging from $300 to $2800. The National Insurance Company has 568 policy holders. The ratio of fire loss to policy holders in the National Company is one fire to 114 policy holders.

WHY THIS GREAT DIFFERENCE

in ratio in favor of the Hardware Mutual Company? The answer is ready. Ours is class insurance. We do not have more than two, three or four risks in any given community and these in all likelihood widely separated. Your chance of being called upon to help pay for fire losses in the stock companies is 425 per cent. greater than in our Hardware mutuals.

There may be in your mind this question: How can the Hardware mutuals safely declare such dividends? The answer is plain. In the stock company you are co-insured with dry goods, boots and shoes, groceries, drug stores, general stores, confectioneries, car barns, factories, machine shops, railroad shops, manufacturing establishments of countless variety; also dwelling houses and personal property. The losses on these lines are great.

OUR COMPANY TAKES NO RISKS

on any of these lines; hence you do not help to pay for any of these losses in our mutual companies. Another point: in the stock companies you are co-insured with every nationality under the sun; but without reflection on any foreign born citizen, the moral hazard, in my opinion, in our Hardware mutuals is 500 per cent. better than any stock company. Again, in the stock companies you are co-insured with policy holders whose policies may be ten times as large as yours. If such a policy holder has a total loss he calls on you for ten times as much as you could call upon him for if you had a total loss. And, lastly, while the stock companies make an effort to separate their risks as much as possible it is still the fact that

RISKS IN A STOCK COMPANY ARE "BUNCHED"

many times more than in our mutual companies. And yet nine-tenths of the men here are carrying all of their insurance in stock companies when it is quite clear that Hardware mutual fire insurance is based on the most ideal and the most rational plan of insurance known.

HOW $100,000 IS LOST.

Six thousand Hardwaremen, members of the National Association, voluntarily subscribing to its constitution, constitute a power which, when acting in unison, can accomplish ends of tremendous importance. If each of these 6000 members carried a full limited policy in the National Insurance Company the total risk would be $18,000,000. Averaging this at a rate of $1.50 the annual premium would be $270,000. The interest our company would receive from the investment and depositing of such premiums as this would far more than pay all the salaries and expenses of management. If managerial expenses can be made out of interest from investments and deposits, thus leaving the original premium chargeable with fire losses only, the dividends under these conditions would be large. Figuring on a basis of 35 per cent., the dividend on this sum would be $94,500 per annum. That these 6000 members carry insurance greatly in excess of $18,000,000 with stock companies is beyond question; that these 6000 members do not carry anything like $18,000,000 with our mutual companies is equally true; that these 6000 members lose therefore annually $100,000 in insurance premiums is a simple sum in arithmetic.

A USE FOR THE PROFITS.

If a fraction of this sum so freely abandoned by the national membership was contributed annually to the treasury of the National Hardware Association there is no reasonable trade adjustment in the interests of the Hardware dealer that could not be accomplished. In no field of association effort would concert of action produce such visible results. I believe a working plan can be developed whereby a revenue from the business of the National Insurance Company could be set apart for the National Hardware treasury. This can only be done, however, by heavy concentration of business in the National Insurance Company. If the National Insurance treasury had the premium or deposit required on $18,000,000 insurance the income from this deposit at 4 per cent. would be $108,000 per annum; all operating expenses being paid out of this, there would remain a surplus of several thousand dollars which by agreement could be paid into the treasury of the National Hardware Association. Under this arrangement the policy holders' expectations of mutual dividends are in no wise abridged, but, on the contrary, are enhanced, because operating expenses would be met out of the income from deposits; whereas now operating expenses are taken bodily from the deposits. Under this arrangement the sinews of war would be placed where there is the greatest need and also where the greatest good is accomplished. Under this arrangement

THE DYNAMIC POWER OF 6000 HARDWARE MERCHANTS

is applied for their personal and associated interests. That this is not done is a regrettable loss. Why this loss? Because of hesitation and prejudice. Throw them to the winds; the first marks the timid and weak, the second the narrow and small; walk squarely into the sunlight of optimism, opportunity and success. When the annals of the National Hardware Association are graven on the page of history the most enduring institution recorded will be the Mutual Fire Insurance Company.

Pike Razor Hone Assortments.

The Pike Mfg. Company, Pike, N. H., owing to the success of its oilstone and scythestone selling cabinets is now putting on the market Pike's razor hone assortments. These assortments are offered in two sizes, one size costing the retail dealer $18 and the other $10, being designated as razor hone assortments Nos. 1 and 2, respectively. In each assortment is found a well selected variety of high-class hones displayed in a nicely varnished case and protected by a glass cover. The attractiveness of package which so appeals to the merchant, as shown in the oilstone and scythestone cabinets, is enhanced in the razor hone assortments, The company is sending out an attractive booklet relating to its various selling assortments, a copy of which may be had on application.

Buffalo Blacksmiths' Hand Punch.

Some tools possess a peculiar value because of their convenience and adaptability rather than on account of any remarkable results that their operation affords. Such a tool is the blacksmiths' hand punch, illustrated herewith. Fig. 1 shows it open and Fig. 2 closed. While its great power, obtained through the long leverage of the handle and the cam motion in the head, enables it to punch as large as ½-inch hole in No. 14 iron or ¼-inch hole in

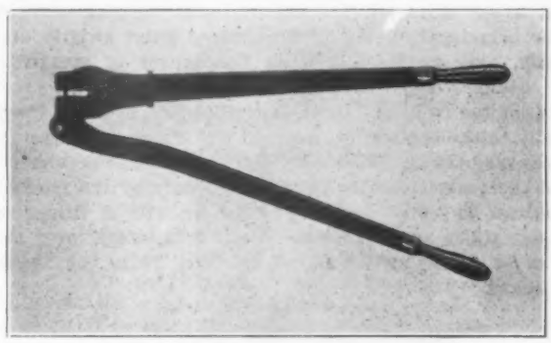


Fig. 1.—Buffalo Blacksmiths' Hand Punch, Open.

¼-inch iron, yet its chief merit lies in its handiness. Bands or straps in position can be easily and quickly punched where otherwise they must be detached and heated or carried to the stationary punch. This is of even more important in sheet metal and tank work, where it is desirable that the rivet holes in lap joints should be punched as both sheets are held in position. Besides the ready accessibility which this tool affords, the narrow head permits punching holes in curves of small radius such as tank head flanges, ferrules and bands of small diameter. The clearance from die to end of head is only 0.518 inch so that holes can be punched close up to corners, making a very valuable feature where light angle iron framing has to be done. The total depth of jaws is

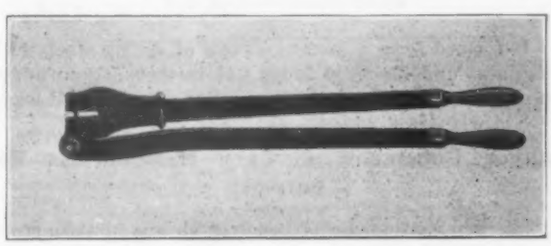


Fig. 2.—Buffalo Blacksmiths' Hand Punch, Closed.

2 inches, permitting a hole to be punched that distance in from the edge of the plate. The head of the punch into which the handles are fastened is a solid drop forging, machined to take the die, punch retainers, pins, &c. Both punch and die are held in steel bushings or sleeves which are so arranged that different sizes can be readily substituted, constituting a feature which it is claimed that this machine alone embodies. It should be noted, however, that the working pressure is brought to bear directly on the punch and not through intermediate fittings, which insures the easiest possible action and does not subject such parts to unnecessary strain. The powerful pressure needed is secured by a cam which forms part of the upper lever. The tool punches any sized hole from 3-32-inch to 2 inches, advancing by thirty-seconds. It measures 32 inches over all and weighs 15 pounds. The Buffalo Forge Company, Buffalo, N. Y., is the manufacturer.

The Duplex Coaster.

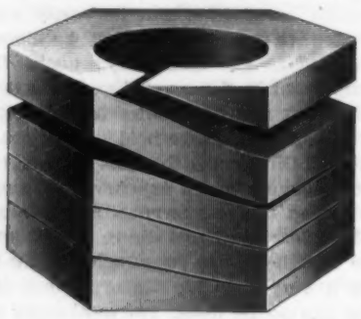
The Household Mfg. Company, Royersford, Pa., is offering the coaster shown in the accompanying illustration, the steering gear of which, it is explained, accurately, swiftly and positively controls the direction in which

The Duplex Coaster.

it moves. The coaster is made of the best seasoned oak, each runner being bolted with two bolts extending entirely through the frame. It is pointed out that the patent steering gear by which both the front and rear bobs are acted upon enables the operator to make short turns and avoid obstacles, the simultaneous turning of both bobs bringing the sled to the desired point swiftly and easily, and greatly minimizes the danger of upsetting. By means of a patent slot in the rear bob and the pivot joint of the front one the coaster is made to adapt itself easily to the contour of the road and street and thus assures easy riding. Foot rests are provided for each rider, and the coaster's capacity is limited only by the number who can be seated on it. The coaster will be furnished in two styles and three sizes, ranging in length, over all, from 63 to 87 inches and from 48 to 72 inches length of board.

Smith Improved Lock Nut.

Smith Improved Lock Nut Company, Rockford, Ill., is putting on the market the lock nut shown herewith. The



Smith Improved Lock Nut.

nut is formed from a hexagonal coil of spring steel, with horizontal and diagonal faces. It is threaded to admit the ordinary track or machine bolt of all standard sizes.

Thayer Robertson & Cary Hammerless Revolvers.

The hammerless model revolver shown in the accompanying cut is being put on the market by Thayer Rob-

Thayer Robertson & Cary Hammerless Revolvers.

ertson & Cary, Norwich, Conn. The frame has no hammer slot and no top or side plates, and in connection with the drop forged barrel catch is claimed by the makers to be as strong and safe as the so-called solid frame models. The rebounding pin and new and improved extracting cam are referred to as strong features, while the cylinder is held in place without the necessity of extra parts or springs. The rubber stock, it is remarked, provides a readily distinguishable feature of the new line, the emblem on it being a Spanish bugle.

Spring Latch No. 275.

Hardware Supply Company, Grand Rapids, Mich., is placing on the market the latch and knob shown in the accompanying cuts. In Fig. 1 the latch is illustrated as it appears on the inside of a door with an adjustable

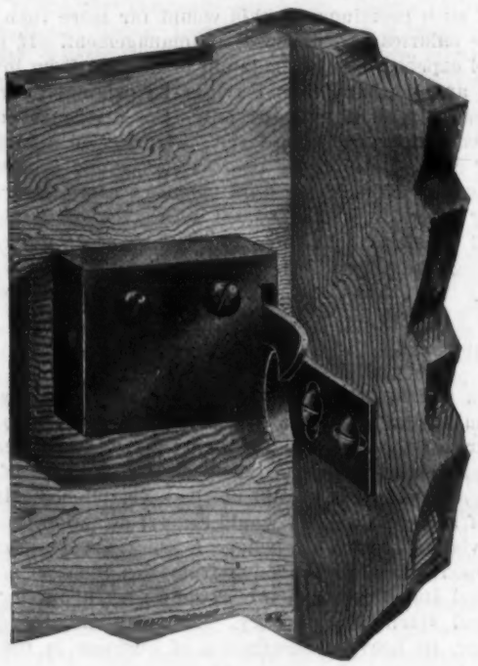


Fig. 1.—Spring Latch No. 275.

striker. A ⅜-inch hole only is bored through the door stile through which the latch bolt passes, making it easy to put on. The knob, Fig. 2, is the best one of the company's styles for use on cupboards, although several other styles of trimmings can be used with the same

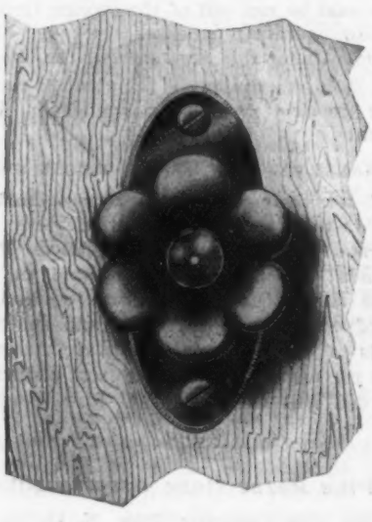
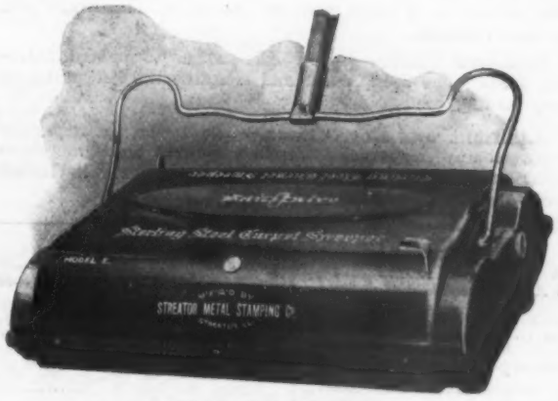


Fig. 2.—Knob B for No. 275 Latch.

latch, both in the way of knobs and finger pulls. The goods are furnished in all hardware finishes, and are designed for use on cupboards, bookcases, china closets, &c., in place of the regular cupboard catches and turns.

Sterling Steel Carpet Sweeper.

The accompanying cut represents one model of steel carpet sweepers manufactured by the Streator Metal Stamping Company, Streator, Ill. The case is made of cold drawn sheet steel pressed to form to make a rigid and light case, which is alluded to as not cracking or

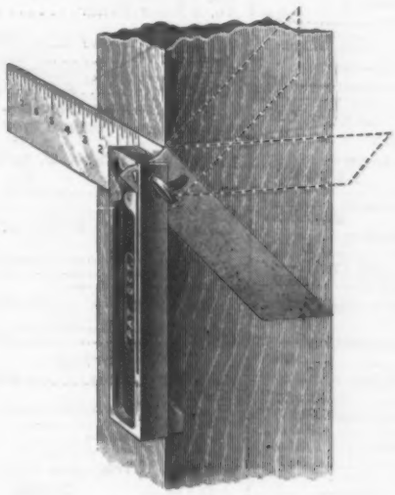


Sterling Steel Carpet Sweeper.

warping and as not being affected by heat, cold or rust. The wheels are made of pressed cold rolled steel to have them true running and to give positive rotation of the brush with the least possible friction. Among other points of excellence the following are mentioned: That the bearings are constructed in such a way as to make them light running; that the broom action construction does away with axles passing through the case, leaving the interior of the case free, so that there is nothing to hold dust in the dumping pans; that the pans open full allowing all dust to dump at once; that the pans are made of the highest grade of tin, folded in such a manner as to prevent sagging at the corners and digging into the carpet; that the sweeper cannot become clogged with ravelings, and that all working parts are protected from dirt and dust. The wooden handle is provided with a long screw, which is threaded into the steel bail. An antitipping device prevents tipping when the sweeper is drawn back quickly or when it comes in contact with wrinkles in the carpet. The materials and workmanship entering into the sweeper are guaranteed by the maker as the best.

Ideal Bevel-Try Square.

Nicholls Mfg. Company, Ottumwa, Iowa, is putting on the market the bevel-try square shown herewith. This is a combination of a bevel and try square by which the square and bevel cut can be marked off with one continuous stroke of a pencil without having to change the square. The bevel blade is easily changed to any angle, as the slot in the bevel blade will allow shifting it so it will always come to the corner of the try square blade. By setting the bevel blade at right angles to the try square blade both marks are obtained without changing the position of the square. For beveling a board on edge the bevel blade is swung over to the back of the handle, which gives a straight surface on the handle. When the bevel blade is not needed it can be closed in the handle, leaving a regular try square. The try square blade is



Ideal Bevel-Try Square.

graduated in eighths, the figures being plainly stamped. All parts are made of best steel except the handle, which is made of composition metal to prevent rusting. The tool is made in one size only, No. 1, 8 inch, in polished steel and nickel plated.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	9⅛@ 9¼
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
In Barrels	@ 6
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price	@ 1½
Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	
Lead, White, Dry in bbls	@ 6
Zinc, American, dry	4⅝@ 4¾
Zinc, French:	
Paris, Red Seal, dry	.8¾
Paris, Green Seal, dry	.9½
Antwerp, Red Seal, dry	.7½
Antwerp, Green Seal, dry	.8½
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	11¾@12¼
Lots of less than 1 ton	.12 @12½
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	10½@11
Lots of less than 1 ton	10¾@11¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	5 @10
Black, Drop, Amer	4 @ 6
Black, Drop, Eng	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	.29 @32
Blue, Prussian	.27 @30
Blue, Ultramarine	14½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.50@3.60
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
Litharge, American, bbls	6 @ 6½
Ocher, American	₱ ton $8.50@16.00
Ocher, American Golden	2½@ 3½
Ocher, French	1¼@ 2½
Ocher, Foreign Golden	3 @ 4
Orange Mineral, English	8 @10
Orange Mineral, French	10¾@12¾
Orange Mineral, German	8 @10
Orange Mineral, American	8 @ 8¾
Red, Indian, English	4½@ 5½
Red, Indian, American	3 @ 3¾
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
Red Venetian, English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9¼
Sienna, Ital., Raw, Powd	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Talc, French	₱ ton $15.00@30.00
Talc, American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb 90 @1.00
Terra Alba, English	₱ 100 lb 90 @1.00
Terra Alba, American, ₱ 100 lb., No. 1	.60 @70
Terra Alba, American, ₱ 100 lb., No. 2	.45 @50
Umber, T'key, Bnt. & Pow	2½@ 3½
Umber, Turkey, Raw & Pow	2½@ 3½
Umber, Burnt, Amer	1½@ 2
Umber, Raw, Amer	1½@ 2
Yellow, Chrome	.11 @14
Vermilion, American Lead	.10 @25
Vermilion, Quicksilver, bulk	@65
Vermilion, Quicksilver, bags	@68
Vermilion, English, Import	.75 @80
Vermilion, Chinese	$0.90@1.00

Colors in Oil—

	₱ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.10 @15
Green, Paris	@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

Miscellaneous—

Barytes, White, Foreign	₱ ton $17.50@19.00
Barytes, Amer. floated	₱ ton 18.00@19.00
Barytes, Crude, No. 1	₱ ton 10.00@11.00
Chalk, in bulk	₱ ton 3.00@ 3.25
Chalk, in bbls	₱ 100 lb .@ .35
China Clay, English	₱ ton 11.00@17.00
Cobalt, Oxide	₱ 100 lb 2.50@ 2.60
Whiting, Common	₱ 100 lb .43@ .48
Whiting, Gilders	₱ 100 lb .50@ .55
Whiting, Ex. Gilders	₱ 100 lb .55@ .60

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.75
In bbls. or tubes	1.10 @1.15
In 1 lb to 5 lb cans	2.60 @2.90
In 12½ to 50 lb cans	1.40 @1.55

Spirits Turpentine—₱ gal.

In Oil bbls	63 @63½
In machine bbls	63½@64

Glue—

	₱ lb
Cabinet	11 @15
Common Bone	7 @ 9
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	8 @11
German Hide	12 @18
French	10 @40
Irish	12 @16
Low Grade	9 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached Commercial	35 @37
Bone Dried	45 @47
Button	36 @45
Diamond I	@55
Fine Orange	45 @47
A. C. Garnet	39 @40
D. C.	65 @..
Octagon B	@52
T. N.	40 @42
V. S. O.	58 @60

Animal, Fish and Vegetable Oils—₱ gal.

Linseed, City, raw	.54 @55
Linseed, City, boiled	.56 @57
Linseed, State and West'n, raw	.52 @53
Linseed, raw Calcutta seed	@62
Lard, Extra Prime, Winter	.59 @60
Lard, Extra No. 1	.47 @48
Lard, No. 1	.35 @39
Cotton-seed, Crude, f.o.b. mills	@..
Cotton-seed, Summer Yellow, Prime	.30 @30¼
Cotton-seed, Summer Yellow, off grades	@..
Sperm, Crude	.55 @..
Sperm, Natural Spring	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	.60 @63
Sperm, Bleached Winter	.63 @65
Tallow, Prime	.51 @53
Whale, Crude	@..
Whale, Natural Winter	.42 @44
Whale, Bleached Winter	.46 @48
Menhaden, Brown, Strained	.28 @29
Menhaden, Light, Strained	.29 @30
Menhaden, Bleached, Winter	.31 @32
Menhaden, Ex-Bld. Winter	.32 @33
Menhaden, Southern	16½@17
Cocoanut, Ceylon	₱ lb 6¾@ 7
Cocoanut, Cochin	₱ lb 7¼@ 7½
Cod, Domestic, Prime	.34 @36
Cod, Newfoundland	.39 @41
Red, Elaine	.32 @33
Red, Saponified	₱ lb 4½@ 4¾
Olive, Italian, bbls	.55 @57
Neatsfoot, prime	.49 @50
Palm, Logos	₱ lb 5⅝@ 5¾

Mineral Oils—

Black, 29 gravity, 25@30 cold test	10½@11½
Black, 29 gravity, 15 cold test	11½@12½
Black, Summer	10½@11½
Cylinder, light filtered	.18 @19
Cylinder, dark filtered	.16 @17
Paraffine, 903-907 gravity	12¾@13
Paraffine, 903 gravity	11¾@12
Paraffine, 883 gravity	9¼@ 9½
Paraffine, Red	11½@13

In small lots ½¢ advance.

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ℔ doz. $3.00 ..... 33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent 35%
Taplin's Perfection 35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils ..... ℔ lb 6¾@7 ¢
Hay-Budden, Wrought ..... 9@9¼ ¢
Horseshoe brand, Wrought ..... 9@9¼ ¢
Trenton ..... ℔ lb 9@9¼ ¢

Imported—

Peter Wright & Sons ..... ℔ lb 10¼ ¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00 ..... 15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co. 33⅓%

Augers and Bits—

Com. Double Spur ..... 70&10@75%
Jennings' Patn. reg. finish ..... 50&10%
Black Lip or Blued ..... 60&10%
Boring Mach. Augers ..... 70&10%
Car Bits, 12-in. twist ..... 50&10%
Ford's Auger and Car Bits ..... 40&5%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list .. 25%
No. 30, R. Jennings' list ..... 40&7½%
Russell Jennings' ..... 25&10&2½%
L'Hommedieu Car Bits 15%
Mayhew's Countersink Bits 45%
Millers Falls ..... 50&10&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits ..... 40&10%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 60%
Snell's Car Bits, 12-in. twist ..... 60&10%
Wright's Jennings' Bits 50%

Bit Stock Drills— See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26 .... 50&10%
Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18 ..... 60%
Ford's, Clark's Pattern ..... 60&5%
C. E. Jennings & Co., Steer's Pat .. 25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut .... *$3.00@3.25*
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz. $9.00@10.00
Ames ..... 25&10%
Universal 20%
Wood's Universal 25%

Ship Augers and Bits—

Ford's ..... 33⅓@5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' ..... 35&5%
Ohio Tool Co.'s 40%
Snell's 40%

Awl Hafts— See *Hafts, Awl.*

Awls—

Brad Awls:
Hanaled ..... *gro. $2.75@3.00*
Unhdled, Shldered ... *gro. 63@66 ¢*
Unhandled, Patent .. *gro. 66@70 ¢*
Peg Awls:
Unhandled, Patent .. *gro. 31@34 ¢*
Unhdled, Shldered .. *gro. 65@70 ¢*
Scratch Awls:
Handled, Com ... *gro. $3.50@4.00*
Handled, Socket .. *gro. $11.50@12.00*
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights:
First Quality *$6.75*
Second Quality *$6.25*
Double Bit, base weights:
First Quality *$8.75*
Second Quality *$8.25*

Axle Grease— See *Grease, Axle*

Axles— Iron or Steel

Concord, Loose Collar ... 4¼@4¾ ¢
Concord, Solid Collar ... 4¾@5¼ ¢
No. 1 Common, Loose ... 3¼@3¾ ¢
No. 1½ Com., New Style 3¾@4¼ ¢
No. 2 Solid Collar ..... 4@4½ ¢
Half Patent:
Nos. 7, 8, 11 and 12 .... 75@75&5%
Nos. 13 to 14 ..... 70&10@75&5%
Nos. 15 to 18 ... 75&10@75&10&5%
Nos. 19 to 22 ... 75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb., 4½@5 ¢
Common and Concord, turned. lb., 5½@6 ¢
Half Patent ..... lb. 8½@9 ¢

Bait— Fishing—

Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances— Sash—

Caldwell new list 50%
Pullman ..... 50&10@60%

Spring—

Spring Balances ..... 60@60&5%
Chatillon's:
Light Spg. Balances ..... 40&10%
Straight Balances 40%
Circular Balances 50%
Large Dial 30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb. .... *per lb., 2¾@3¼ ¢*

Towel—

No. 10 Ideal, Nickel Plate .. ℔ gro. $8.50

Beams, Scale—

Scale Beams ..... 40&10@50%
Chattillon's No. 1 ..... 30%
Chattillon's No. 2 ..... 40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized .. ℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric ..... ℔ gro. $7.80
No. 2 Buffalo ..... ℔ gro. $9.00
No. 3 Perfection Dust ..... ℔ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned .... ℔ doz. $1.20
Holt, No. 1, Tinned ..... ℔ doz. $1.50
Holt, No. B, Japanned .... ℔ doz. $2.00
Holt, No. 2, Tinned ..... ℔ doz. $2.25
Lyon, No. 2, Japanned .... ℔ doz. $1.25
Lyon, No. 3, Japanned .... ℔ doz. $1.50
Taplin Mfg. Co.: ℔ gro.
No. 60 Improved Dover $6.00
No. 75 Improved Dover $6.50
No. 100 Improved Dover $7.00
No. 102 Improved Dover, Tin'd .. $8.50
No. 150 Improved Dover, Hotel .. $15.00
No. 152 Imp'd Dover, Hotel, T'd .. $17.00
No. 200 Imp'd Dover Tumbler $8.50
No. 202 Imp'd Dover Tumbler, T'd .. $9.50
No. 300 Imp'd Dover Mammoth, ℔ doz. $25.00
Western, W. G. Co., Buffalo $7.00
Wonder (S. S. & Co.) ℔ gro. net, $6.00

Bellows—

Blacksmith, Standard List .. 60&10@70&10%

Hand—

Inch	6	7	8	9	10
Doz	$4.50	5.00	5.50	6.00	6.50

Molders—

Inch	9	10	11	12	14
Doz	$8.00	9.00	10.50	12.50	14.50

Net Prices.

Bells— Cow—

Ordinary goods ... 75&5@75&10&5%
High grade ..... 70&10@70&10&5%
Jersey ..... 75&10%
Texas Star 50%

Door—

Abbe's Gong 45%
Burton Gong 50%
Home, R. & E. Mfg. Co.'s ..... 55&10%
Lever and Pull, Sargent's .... 60&10&10%
Trip Gong ..... 50&10@50&10&5%
Yankee Gong 50%

Hand—

Hand Bells, Polished, Brass .. 60&5@60&10&5%
White Metal 60%
Nickel Plated .... 50&10@50&10&5%
Swiss ..... 60@60&7½%
Cone's Globe Hand Bells ..... 33⅓@33⅓%
Silver Chime ..... 33⅓@35%

Miscellaneous—

Farm Bells ..... lb. 2¼ ¢
Steel Alloy Church and School 50&10&5@60&5%
American Tube & Stamping Co. Gongs 75%
Table Call Bells ..... 50@50&10%

Belting— Leather—

Extra Heavy, Short Lap .. 60&5%
Regular Short Lap .... 60&10&5%
Standard 70%
Light Standard ..... 70&5%
Cut Leather Lacing 60%
Leather Lacing Sides, per sq. ft. 22¢

Rubber—

Agricultural (Low Grade) .... 75@75&5%
Common Standard .... 70@70&10%
Standard ..... 65&70%
Extra ..... 60&5@60&10%
High Grade ..... 50&5@50&10%

Bench Stops— See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden ... 70&10@75&5%
Harts St. Tackle Blocks ..... 50@50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves ..... 50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty. Mal. Iron .... 50&10%
Stowell's Self Loading 60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c ... 30&10@40&10%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co. 33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅝ x 6 and Smaller ..... 75&10%
Larger and Longer ..... 65&10&2½&10%
Phila. Eagle $3.00 list May 2, '99 80%
Bolt Ends, list Feb. 14, '95 .... 70&2½&10%
Machine, ⅜ x 4 and smaller 75&2½&10%
Machine, larger and longer .. 70&2½&10%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch	3	4	5	6	8
Per doz	$0.30	.35	.45	.56	.75

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10
Per doz	$1.15	1.40	2.00

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz	$0.95	1.25	1.55

Cast Iron Shutter, Japanned, Brass Knobs:

Inch	6	8	10
Per doz	$0.80	.90	1.20

Wrt Barrel Japd ..... 80&10&10%
Wrt " Bronzed .... 50&10&10%
Wrt. Spring ... 70&10@70&10&10%
Wrt. Shutter ..... 50&5@50&10&5%
Wrt. Square Neck ..... 75@75&10%
Wrt Square .. 66⅔&10@66⅔&10&10%
Ives' Patent Door 60%

Plow and Stove—

Plow ..... 65&10@65&10&10%
Stove ..... 82½&10@82½&10&5%

Tire—

Common 80%
Norway Iron 80%
American Screw Company:
Norway Phila., list Oct. 16, '84 .. 80%
Eagle Phila., list Oct. 16, '84 .... 82½%
Bay State, list Dec. 28, '99 ..... 80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 .. 80%
Eagle Phila., list Oct. 16, '84 .... 82½%
Eclipse, list Dec. 28, '99 ..... 80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84 .... 80%
Eagle Phila., list Oct. 16, '84 .... 82½%
Mount Carmel, list Dec. 28, '99 .. 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ..... 80%
Norway Phila., list Oct., '84 ..... 80%
Upson Nut Co.:
Tire Bolts 72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz	$4.80	5.60	6.40	8.00
Inch	2¼			2½
Per doz	$6.65			11.50

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 30%
Langdon ..... 15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.:
Nos. 240 to 460 ..... 30%
Nos. 50 and 60 ..... 35%

Braces—

Common Ball, American .. *$1.25@1.30*
Barber's ..... 50&10&10@60&10%
Fray's Genuine Spofford's 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 ..... 60%
C. E. Jennings & Co. ..... 50&5%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat .. 50%
Millers Falls Drill Braces ..... 25&10%
P., S. & W. Co., Peck's Pat. 60@60&5%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—

Wrought Steel ... 80&10@80&10&5%
Bradley's Wire Shelf ..... 80&10@85%
Griffin's Pressed Steel ..... 80@80&10%
Griffin's Folding Brackets ..... 70&10%
Stowell's Cast Shelf 75%
Stowell's Sink 50%
Western, W. G. Co., Wire ..... 60&10%

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co. ..... 75&20%
Western, W. G. Co. 80%
Wire Goods Co. ..... 75@75&10%

Buckets, Galvanized—

Price per dozen.

Quart	10	12	14
Water, Regular	1.40	1.70	1.90
Water, Heavy	3.40	3.70	3.80
Fire, Rd. Bottom	2.30	2.55	2.95
Well	2.55	2.87	3.15

Bucks, Saw—

Hoosier ..... ℔ gro. $36.00

Bull Rings— See *Rings, Bull*

Butts— Brass—

Wrought, list Sept., '96 ..... 30%
Cast Brass, Tiebout's 50%

Cast Iron—

Fast Joint, Broad .... 40&10@50%
Fast Joint, Narrow .... 40&10@50%
Loose Joint ..... 70&10@75%
Loose Pin ..... 70&10@75%
Mayer's Hinges ..... 70@70&5%
Parliament Butts ..... 70@70&5%

Wrought Steel—

Table and Back Flaps ... 75%
Narrow and Broad 75%
Inside Blind 75%
Loose Pin 75%
Loose Pin, Jap'd ..... 70&10%
Loose Pin, Ball and Steeple Tip 85%
Japanned Ball Tip Butts ... 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts .... 55&10%

Ex. 10&10&5@10&10&10%

Cages, Bird—

Hendryx Brass:
3000, 5000, 1100 series 5%
1200 series 33⅓%
200, 300, 600 and 900 series ..... 40&10%

Hendryx Bronze:
100, 800 series....40&10%
Hendryx Enameled....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb.4¢@4¼¢
Sharp, 1 prong...per lb., 4½@4¾¢
Gautier, Blunt....4@4¼¢
Gautier, Sharp....4½@4¾¢
Perkins', Blunt Toe....₱ lb 3.65¢
Perkins', Sharp Toe....₱ lb 4.15¢

Can Openers—

See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern.....	$1.35	1.85	2.05 each.
New York Pattern..	1.50	2.20	2.45 each.
Baltimore Pattern..	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket .....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd..$1.90
B. B. Caps, Round Ball....$1.49
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed .....70@70&10%
Plate .....60&10@60&10&5%
Philadelphia .....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss .....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$7.50	5.35	4.40	3.70	3.55	3.45	3.40

⅝ ¾ ⅞ 1 to 1¼ inch,
$3.35 3.30 3.25 3.25 per 100 lb.

German Coil.....60&10&10@70%

Halters and Ties—

Halter Chains...60&10@60&10&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Cow Ties.....60@60&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring..$23.50
6½—6-2, Str'ght, with ring..$24.50
6½—8-2, Str'ght, with ring..$28.00
6½—10-2, Str'ght, with ring.$32.00

NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.

Trace, Wagon and Fancy Chains .....60&5@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron .....60&10@60&10&5%
Brass .....60&10@60&10&10%
Safety Chain.....75@75&10&5%
Gal. Pump Chain....lb. 5@5¼%
Covert Mfg. Co.:
Breast .....35&5%
Halter .....35&5%
Heel .....35&5%
Rein .....35&5%
Stallion .....35&5%
Covert Sad. Works:
Breast 70%
Halter 70%
Hold Back.....70%
Rein 70%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Am. Dog Leads and Kennel Chains, 40@40&5%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties....45&5@50&10&5%
Niagara Dog Leads and Kennel Chains .....45@60&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....60%

Chain and Ribbon, Sash—

Oneida Community:
Copper Chain.....60&5%
Steel Chain.....60%
Pullman:
Bronze Chain.....60%
Steel Chain.....60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@$3.00
Sash Ribbon Attachments, per set.8¢

Chalk—(From Jobbers.)

Carpenters' Blue.....gro. 35@38¢
Carpenters' Red.....gro. 30@33¢
Carpenters' White....gro. 25@28¢
See also Crayons.

Checks, Door—

Bardsley's 45%
Eclipse .....60&10%
Pullman, per gro.....$54.00
Russwin 40%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—Socket Framing and Firmer

Standard List.....75@75&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60%
C. E. Jennings & Co. Socket Framing No. 15.....60%
Ohio Tool Co.'s.....70%
Swan's 75%
L. & I. J. White.....30@30&5%

Chisels—Tanged—

Tanged Firmers..33 1-3@33 1-3&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White, Tanged.....25&5%

Chisels—Cold—

lb.
Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Beach Pat., each $8.00.....35&5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....50%
Universal 50%
Combination 50%
Drill Chucks, New Model.....30%
Drill Chucks, Standard.....45%
Drill Chuck, Skinner Pat., all sizes.35%
Drill Chucks, Positive Drive.....30%
Planer Chucks.....25%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination 50%
Czar Drill.....35%
Combination Geared Scroll.....40%
Geared Scroll.....40%
Independent 50%
Independent Steel.....40%
Union Drill.....45%
Universal 50%
Independent Iron F. Plate Jaws.40%
Independent Steel F. Plate Jaws.40%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co. .....40&10@50%
Carriage Makers', Sargent's.....60%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co. 40%
Saw Clamps, see Vises, Saw Filers'.
Wood Workers, Hammers'.....40&10%

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $5.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓&33⅓&10%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse.....$8.75 } 15%
1902 Chicago Horse.....10.75 }
20th Century Horse, each, $5.00...20%
Lightning Belt.....$15.00 }
Chicago Belt.....$20.00 } 15%
Stewart's Patent Sheep, $12.75....20%

Clips, Axle—

Eagle, 5-16 and ⅜ in..75@75&10%
Norway, 5-16 and ⅜ in..60&10@70%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks.....70&10@75%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list 40%

Combs, Curry—

Metal Stamping Co.....40%

Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses, Dividers, &c.

Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers 65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses 50%

Conductor Pipe,—

L. C. L. to Dealers:
Galvanized.

Territory.	*Nested.*	*Not nested.*
Eastern	70&15%	70&10%
Central	70&7½%	70&2½%
Southern	70&2½%	60&20%
So. Western	60&20%	60&10%

Copper. 14&16 oz.
Eastern .....50&10%
Central .....50&7½%
Southern .....50&2½%
So. Western.....50&2½%

Terms, 60 days; 3% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal, each..	2	3	4	6	8
Labrador ...	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.....	3	4	6	8	
Iceland, ea..	$1.80	$2.10	$2.40	$3.00	
Gal.....	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

Galvanized, Lined, side handles,

Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled.....25%
Agate Lined.....25%

Coopers' Tools—See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 2½ & 3..20@21¢
1½ & 2.....22@23¢

Cord—Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 6 to 12.....lb. 23@24½¢
Cable Laid Italian..... lb., A, 18¢; B, 16¢
Common India.....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..17@19¢
Patent Russia.....lb...@14¢
Cable Laid Russia...lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted..lb. 12@13¢
Anniston Cordage Co.: Braided Cotton, Old Glory, Nos. 7 to 12....₱ lb 29¢
Anniston, Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24½¢; Anniston Drab, Nos. 7 to 12, ₱ lb, 26¢; Anniston Mahogany, 27¢.
Pearl Braided, cotton, No. 6, ₱ lb, 24½¢; No. 7, 23½¢; Nos. 8 to 12, 23¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Peerless:
Cable Laid Italian.....16 ¢
Cable Laid Russian.....14 ¢
Cable Laid India.....12 ¢
Braided India.....18 ¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton.....₱ lb 40 ¢
Braided, Italian Hamp....₱ lb 40 ¢
Braided, Linen.....₱ lb 55 ¢
Braided, White Cotton or Spot.... ₱ lb 35 ¢
Massachusetts, White.....₱ lb 28 ¢
Massachusetts, Drab.....₱ lb 32 ¢
Phoenix, White, Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Silver Lake:
A quality, Drab.....40 ¢
A quality, White.....35 ¢
B quality, Drab.....35 ¢
B quality, White.....30 ¢
Italian Hemp.....40 ¢
Linen .....57½¢
See also Chain and Ribbon.

Wire, Picture—

List Oct., '00.....85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—

Grain .....40&12½%

Crayons—

White Round Crayons, gr. 5½@6¢
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.: (Case lots, 20%)
Jumbo Crayons.....gr. $3.50
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Zelnicker's Lumber:
Red, Blue, Green.....₱ gro. $6.50
Black .....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor .....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward 40%

Meat and Food—

American 30%

Nos.....	1	2	3	4	B	5
Each.....	$5	$7	$10	$25	$50	$60

Enterprise .....25@25&7½%

Nos.....	5	10	12	22	32
Each.....	$2	$3	$2.75	$4.50	$6

Dixon's .....₱ doz. 40@50%

Nos....	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal .....40&10@50%
Little Giant.....₱ doz. 40@50%

Nos....	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....25%
New Triumph No. 605, ₱ doz. $20.00.. 40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's .....₱ doz. 40@50%

Nos.....	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater .....₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$30

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise .....25&30%
National, ₱ doz., No. 1, $21; No. 2, $18 .....40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's, Nos. 12 and 21.....60&10%

Washer—

Appleton's, ₱ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz. $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers .....₱ doz. $6.25
Iwan's Perfection Post Hole Digger.. ₱ doz. $8.25
Iwan's Split Handle Post Hole Diggers .....₱ doz. $7.25
Kohler's Universal.....₱ doz. $14.00
Kohler's Little Giant.....₱ doz. $12.00
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9.00
Kohler's Rival.....₱ doz. $8.00
Kohler's Pioneer.....₱ doz. $7.00
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ⅞ in....₱ doz. $10.00
Phillips', style 077, ⅞ in....₱ doz. $7.50
Phillips', style x-y, ⅞ in....₱ doz. $10.50

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each .....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 012.....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.... 60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@60¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 .....50%
Buck Bros.' Screw Driver Bits.....30%
Champion 50%
Edson 60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood 40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42...15&10%
New England Specialty Co.....50&10%
Sargent & Co.'s:
Nos. 1 and 60.....50&10&10%
Nos. 50, 53 and 55.....60&10%
Nos. 20 and 40.....70&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles.....65%
No. 88.....75%
Victor 55%
Defiance 70%
Swan's
Nos. 7565 to 7568.....50%
No. 7540.....40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L.*
Eastern	*80&5%*
Central	*75&10&10%*
Southern	*75&12½%*
So. Western	*75&5%*

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:

Galv. Steel and Galv. C. C. Iron and Steel, Standard Gauge	*60&10%*
No. 26	*35%*
No. 24	*25%*
No. 22	*10%*
Copper	*37½%*

Perfect Elbows (S., S. & Co.).....40%

Emery, Turkish—

	4 to ½	*5 to 1*	*80 Flour*
Kegs .....lb.	*5 ¢*	*5½¢*	*5½¢*
½ Kegs.....lb.	*5½¢*	*5¾¢*	*5¾¢*
¼ Kegs.....lb.	*5½¢*	*6 ¢*	*4 ¢*
10-lb. cans, 10 in case....	*6½¢*	*7 ¢*	*6 ¢*
10-lb. cans, less than 10.....	*10 ¢*	*10 ¢*	*8 ¢*
Less quantity..	*10 ¢*	*10 ¢*	*8 ¢*

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Walling's .....40&10%

Cord and Weight—
Ives 40%

Faucets—
Cork Lined.....50@50&10%
Metallic Key, Leather Lined.. 60&10@70%
Red Cedar.....40&10@50%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key...40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List revised Nov. 1, 1899.
Best Brands.....70&10@75&5%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103.....$3.75
Special, No. 104.....$3.75
Fusible Links, No. 98.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.15*	*2.85*	*3.25*	*3.75*	*4.50*

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's 70%
Stowell's Giant Grindstone Hanger.. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy .....50&10&10%
Stowell's Grindstone Fixtures, Light.. 60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....60%
Victor, Header.....60%
Champion, Hay.....60%
Champion, Header.....60%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....60%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz..75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.30*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
} 10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.80&10@80&10&5%

Gauges—
Marking, Mortise, &c.....50&10&5@50&10&10&5%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P. S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush.. 25@50%
Cans (½ pts., pts., qts., ½ gal., gal.) .....25@48%
International Glue Co. (Martin's)..40%

Grease, Axle—
Common Grade....gro. $4.50@5.50
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 lb, $1.20; 2 lb, $2.00
Helmet Hard Oil.....25%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—
Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00 } 33⅓%
Pike Mower and Tool Grinder, each .....$6.00 }
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....$3.00

Halters and Ties—
Covert Mfg. Co.:
Web .....35&5%
Jute Rope.....50%
Sisal Rope.....30&10%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties 70%
Sisal Rope Ties.....60&10%
E. T. Rugg & Co.:
Leather Halters.....30%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties 60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—
Handled Hammers—
Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25 $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.....
Engineers' and B. S. Hand..... 50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'..... 40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—
Under 3 lb., per lb. 50¢..... 80&10&10@85%
3 to 5 lb., per lb. 40¢..... 80&10&10@85%
Over 5 lb., per lb 30¢..85@85&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c.....60&5@60&10&5%
Hoe, Rake, &c.:.....45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Champion .....45@45&10%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $2.50@2.85
Brad Awl.....gro. $1.65@1.85
Chisel Handles:
Apple Tanged Firmer, gro. assorted .....$2.40@2.65
Hickory Tanged Firmer, gro. assorted .....$2.15@2.40
Apple Socket Firmer, gro. assorted .....$1.75@1.95
Hickory Socket Firmer, gro. assorted .....$1.45@1.60
Hickory Socket Framing, gro. assorted .....$1.60@1.75
File, assorted.....gro. $1.30@1.40
Hammer, Hatchet, Axe, &c. 60&10@60&10&10%
Hand Saw, Varnished, doz. 80@85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel .....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.... ℔ gro. $0.85@$1.50

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Single Doz.	*$0.90*	*1.25*	*1.60*	*1.95*	*2.50*

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Single Doz.	*$1.30*	*1.85*	*2.50*	*3.00*

Allith Mfg. Co.:
Reliable, No. 1.....per doz. $8.00
Reliable, No. 2.....per doz. $9.60
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10. $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.....60&5%
Hinged.....Net $6.00
Covered .....60&2%
Special .....70&5%
Lawrence Bros.:
Advance .....60&10%
Cleveland 75%
Clipper, No. 75.....60%
Crown .....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant .....60&5%
Hummer .....70&5%
New York.....60&10%
Peerless 75%
Sterling .....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Pioneer Wood Track No. 3..$2.00
Ball B'r'g St'l Track No. 10.50&10%
Roller B'r'g St'l Track No. 12.$2.15
Roller B'r'g St'l Track No. 13.$2.30
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&10%
Trolley B. D. No. 17.....$1.25
Trolley F. D. No. 120.....$2.10
Trolley F. D. No. 121.....$2.25
Trolley F. D. No. 150.....$2.35
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&10%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24.....$1.30
Trolley B. D. No. 27.....$1.40
Trolley B. D. No. 28.....$1.60
Roller Bearings Nos. 39, 41, 43 .....75%
Anti-friction No. 42.....60&20%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 136 .....40%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas 60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator 40%
Express 50%
Freight Car Door.....60%
Interstate .....60&10%
Lundy Parlor Door.....50&10%
Magic 60%
Matchless .....60&10%
Nansen .....70&5%
Parlor Door.....50&10%
Railroad .....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500...50&10%
Underwriters' Fire Door....40%
Wild West Warehouse Door..50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle 70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot 60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis P'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing..℔ doz. $5.00
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing...60&10&5%
New Era Roller Bearing..50&10%
O. K. Roller Bearing..60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing....60&10%
Tandem, Nos. 1 and 2.....60%
Underwriters' Roller Bearing..40%
Velvet 50%
Wilcox Auditorium Ball B'r'g..20%
Wilcox Barn Trolley No. 123..40%
Wilcox Elv. Door, Nos. 112 and 122½.....50%
Wilcox Elv. Door, No. 132....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century..50&10&10%
Wilcox O. K. Steel Track....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing..40%
Wilcox Wideman Narrow Gauge Ball Bearing.....40%
For Track, see Rail.

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminov, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled.. $27.00
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....70&10%

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—
Regular list, first quality.40&7½%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 11 and 13..75&10%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5..... 75&10&5%
Tip Pat'n, Nos. 1, 3 & 5...75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 000, 45 & 55.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'f'es	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch.....doz. ...@$2.00
Without Latch...doz. ...@$1.60
Reversible Self-Closing:
With Latch.....doz. ...@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

Nos.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—
Holdback Cast Iron..... gro. $9.00@$9.50
Non-Holdback, Cast Iron..... gro. $8.00@$8.50
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges 40%
Bommer Spring Hinges.....40%
No. 900 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge 50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Ball Bearing Floor Hinge....50%
Ohio Detachable Screen Door Hinge .....℔ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $8.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k.℔ gro. pr.$9

Extra 10@10% often given.

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges...70%
H'vy Strap H'g's...75&5%
Light T Hinges.....65%
Heavy T Hinges.....60%
Extra H'y T H'g's.70&10%
Hinge Hasps.....50%
Cor. Heavy Strap..75&5%
Cor. Ex. Heavy T.70&10%
Extra 10@10&5%

Screw Hook and Strap.
6 to 12 in..lb. 3½¢
1½ to 20 in..lb. 3¼¢
22 to 36 in..lb. 3 ¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6 ¢
⅝-inch.....lb. 7 ¢
½-inch.....lb. 9 ¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods— Coal—

	Per doz.			
Inch	15	16	17	18
Galv. Open	$2.50	2.75	3.00	3.25
Jap. Open	$1.90	2.10	2.25	2.55
Galv. Funnel	$3.00	3.30	3.60	3.90
Jap. Funnel	$2.45	2.65	2.85	3.30

Masons' Etc.—

Avery-Caldwell Mfg. Co.:
Steel Brick.....each $1.00
Steel Mortar.....each $1.25
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....35%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₩ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₩ doz. 66⅔%
Junior Size.....₩ doz. $4.00
Ft. Madison Sprouting Hoe..₩ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6¾ in.....$3.35
Acme Wedding.....₩ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ₩ doz. $4.65

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₩ doz. $24.00.....45&10%

Door—

Bardaley's.....45%
Empire.....50%
Pullman.....50%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₩ gross, $10.80; ₩ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List, Nos. 29, 32, 33, 129, 132, 133 and 135.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt.....80&10@..%
Wire C. & H. Hooks:.....
75&10@75&10&10%
Atlas, Coat and Hat.....75&10%
Bradley Metal Clasp Coat and Hat.....75&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..75&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co, Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....75%
Czar.....65%
V Brace.....75%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.50
Grass, common grades, all sizes, per doz......$1.30
Whiffletree.....lb. 5¾@6¢
Hooks and Eyes:
Brass.....60&10&5@60&10&10%
Malleable Iron..70&10@70&10&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ₩ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 5 @ 6 ¢
3-ply Standard.....ft. 8 @ 9 ¢
4-ply Standard.....ft. 10 @11 ¢
3-ply extra.....ft. 11 @13 ¢
4-ply extra.....ft. 14 @16 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons— Sad—

From 4 to 10.....lb. 3¾@3 ¢
B. B. Sad Irons.....lb. 3¼@3½¢
Chinese Laundry....lb. 4¾@5 ¢
Chinese Sad.....lb. 4 @4¼¢
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Jap'd Tops	62	59	72	69
Tin'd Tops	65	62	75	72

New England Pressing..lb. 3¾@4¢

Pinking—

Pinking Irons.....doz. 50@60¢

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%
Steel.....45%
Covert's Saddlery Works:
Daisy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....75%
C. E. Jennings & Co. Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5&25%

Hay and Straw—

Serrated Edge..per doz.$5.25@5.50
Iwan's Sickle Edge.....₩ doz. $9.50
Iwan's Serrated.....₩ doz. $10.00

Mincing—

Buffalo.....₩ gro. $13.00

Miscellaneous—

Farriers'.....doz. $3.00@3.25
Wostenholm's.....₩ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip.....gro.$1.15@1.20
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardaley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns—Tubular—

Regular Tubular, No. 0.....
doz. $4.25@4.85
Lift Tubular, No. 0.....
doz. $4.50@5.15
Hinge Tubular, No. 0.....
doz. $4.50@5.15
Other Styles.....40&10@40&10&5%

Bull's Eye Police—

No. 1, 2¾-inch.....$2.50@2.75
No. 2, 3-inch.....$2.75@3.00

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ₩ doz. $2.00
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; *large*, 60¢
Covert Mfg. Co., Cotton and Hemp.45%

Lifters, Transom—

R. & E.....33⅓%

Lines—

Wire Clothes, Nos.	18	19	20
100 feet	$2.20	2.00	1.70
75 feet	$1.80	1.70	1.30

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₩ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ₩ gro., $24.00; Gilt Edge, $22.00; Air Line, $22.00; Acme, $17.00; Alabama, $15.00; Empire, $14.00; Advance, $13.50; Oriole, $20.00; Albemarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $8.50; Allston, $12.50; Calhoun, $11.00.

Locks— Cabinet—

Cabinet Locks...33⅓@33⅓&7½%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's.....50%

Padlocks—

Wrought Iron....75&10&5@80&8%
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10%
Iron.....62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—

Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Swan's Improved.....40&10%
Angular.
Jennings', Nos. 1 and 4.....35&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—

Reisinger Invincible Hand Power.....
₩ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—

Chandler's.....12½%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$54.00
Champion Rotary Banner No. 1.	$54.00
Standard Champion No. 1	$48.00
Standard Perfection	$36.00
Cinti Square Western	$30.00
Uneeda American, Round	$30.00

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Apple-wood.....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.), new list..50&10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25@30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Philadelphia:
Styles M. S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—

Wire Nails and Brads, Papered, List July 20, 1899. .85&10&10@90%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%
Putnam	23	21	20	19	18	....33⅓%
New Putnam	19	18	17	16	16	..10&10%

Western.....₩ lb 8½¢
Jobbers' Special Brands.....
per lb. 8½@10¢

Picture—

	1½	2	2½	3	3½ in.
Brass H'd	.45	.55	.60	.70	.. gro
Por. Head	1.10	1.10	1.10	..	gro

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Mfrs. or U. S. Standard.
Square, Blank.....$5.00
Hexagon, Blank.....$5.50
Square, Blank, C. T & R..$5.20
Hexagon, Blank, C. T. & R. 5.90
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....$5.50
Hexagon, Blank.....$5.90
Square, Tapped.....$5.40
Hexagon, Tapped.....$5.80

Oakum—

Best or Government.....lb. 6¢
U. S. Navy.....lb. 5¾¢
Navy.....lb. 4¾¢
Plumbers' Spun Oakum.....4¼¢
In carload lots ⅛¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....50&10%
Tin or Steel.....65&10@70%
Zinc.....65&10@70%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13.....20%
Malleable, Hammers' Old Pattern, Nos. 1, 2 and 3.....50%
American Tube & Stamping Co.:
Spring Bottom Cans.....70&10&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can—

Per doz.
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle...35@40¢
Sardine Scissors.....$1.75@$3.00
National.....50&10%
Stowell's Sprague.....₩ doz. 35@45¢
Vim Tin Shear and Can Opener, ₩ doz., 75c.; per gro., $7.50

Egg—

Nickel Plate.....₩ doz., $2.00
Silver Plate.....₩ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope.....lb. 14@16¢

Rubber—

(Fair quality goods.)
Sheet, C. I..... 8@10¢
Sheet, C. O. S..... 9@13¢
Sheet, C. B. S.....10@14¢
Sheet, Pure Gum.....50@65¢
Sheet, Red.....40@50¢
Jenkins' '96, ₩ lb 80¢.....25@25&5%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—

S. S. & Co., with gauges—No. 1, $6.25; No. 2, $6.50 ₩ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

Nos.	1	2	3	4	5
Per doz	$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz	$1.95	2.25	2.80	3.15

Roasting and Baking—

Regal, S., S. & Co., ₩ doz., Nos. 5, $1.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ₩ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₩ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos: lb.
lb.....6¢
Building Felt, 8, 10 and 12 lb.
Mill Board, sheet, 40x40 in., 1-32 to ⅛ in......10¢
Roll Board, 1-16 in. and under.....6¢
Roll Board, 3-32 and ⅛ in. 8¢
Per roll
Rosin Sized Sheathing. 500 sq. ft.
Light weight, 25 lbs. to roll
.....85@90¢
Medium weight, 30 lbs. to roll,
.....40@45¢
Heavy weight, 40 lbs. to roll..
.....56@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$38.00@40.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 300 sq. ft.), ton....
$32.50@33.50
2 ply, roll 108 sq. ft.....55@60¢
3 ply, roll 108 sq. ft.....78@85¢

Slater's Felt (roll 500 sq. ft.) .75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) $2.75

Sand and Emery—

Flint Paper and Cloth .60@60&10%
Garnet Paper and Cloth .25%
Emery Paper and Cl'h .50&10@60%

Parers— Apple—

Advance ₱ doz. $4.00
Baldwin ₱ doz. $4.00
Bonanza Improved each $6.50
Daisy ₱ doz. $4.00
Dandy each $7.50
Eureka Improved each $20.00
Family Bay State ₱ doz. $15.00
Improved Bay State ₱ doz. $36.00
Little Star ₱ doz. $5.00
New Lightning ₱ doz. $7.00
Reading 72 ₱ doz. $3.25
Reading 78 ₱ doz. $6.25
Rocking Table ₱ doz. $6.20
Turn Table '98 ₱ doz. $6.00
White Mountain ₱ doz. $5.00

Potato—

Saratoga ₱ doz. $7.00
White Mountain ₱ doz. $6.00

Picks and Mattocks—

List Feb 23, 1899 .75@75&5%
Cronk's Handled Garden Mattock, ₱ doz., $6.40 33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass .60@60&10%
Iron, list Nov. 11, '85 .60@60&10%

Pipe, Cast Iron Soil—

Carload lots.

Standard, 2-6 in. .60%
Extra Heavy, 2-5 in. .70%
Fittings .75%

Pipe, Merchant—

Carload Lots.

	Steel.		Iron.	
	Blk.	Galv.	Blk.	Galv.
⅛ & ¼ in.	67%	51%	65 %	49 %
⅜ & ½ in.	71%	59%	69 %	57 %
¾ to 6 in.	75%	65%	73½%	63½%
7 to 12 in.	70%	55%	68½%	53 %

Pipe, Vitrified Sewer—

Carload lots.

Standard Pipe and Fittings, 2 to 24 in.:

New England .68%
New York and New Jersey .71%
Maryland, Delaware, E. Pa. 75%
West. Pa. and West Va .71%
Virginia .76%
Ohio, Michigan and Ky. .77%
Indiana .77%

NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—
Wood Planes—

Bench, first qual. .40&10%
Bench, Second qual. .50&10%
Molding .33⅓&10%
Bailey's (Stanley R. & L. Co.) .40%
Chapin-Stephens Co.:
Bench, First Quality .40@40&10%
Bench, Second Quality .50@50&10%
Molding .33⅓@33⅓&10%
Toy and German .40@40&10%
Chaplin's .60%
Ohio Tool Co.:
Bench, First Quality .40@40&10%
Bench, Second Quality .50@50&10%
Molding .33⅓@33⅓&10%
Adjustable Wood Bottom .60%
Unicn .60%

Iron Planes—

Bailey's (Stanley R. & L. Co.) .40%
Chaplin's Iron Planes .50&10%
Miscellaneous Planes (Stanley R. & L. Co.) .35%
Ohio Tool Co.'s Iron Planes .60%
Sargent's .60&10%
Union .60%

Plane Irons—

Wood Bench Plane Irons .25&10@30%
Buck Bros. .30%
Chapin-Stephens Co. .30@30&10%
Ohio Tool Co. .30%
Stanley R. & L. Co. .35%
Union .50%
L. & I. J. White .20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse ₱ doz. $8.50

Plates—

Felloe .lb. 3½@4¼¢
Self-Sealing Pie Plates (S., S. & Co.) ₱ doz. $2.00 50%

Pliers and Nippers—

Button Pliers .75&10@80%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers .50&5%
Cronk & Carrier Mfg. Co.:
American Button .75&10%
Cronk's .60%
Stub's Pattern .50%
Combination and others .33⅓%
Heller's Farriers' Nippers, Pincers and Tools .40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers .40%
Swedish Side, End and Diagonal Cutting Pliers .50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds .40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels .30@30&10&10%
Chapin's Imp. Brass Cor. 40@40&10&10%
Pocket Levels .30@30&10&10%
Disston's Plumbs and Levels .70%
Disston's Pocket Levels .70%
C. E. Jennings & Co.'s Iron .33⅓%
C. E. Jennings & Co.'s Iron, Adjustable .40&7½%
Stanley R. & L. Co. .45%
Stanley's Duplex .35%
Woods' Extension .33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00 50%

Points, Glaziers'—

Bulk and 1-lb. papers, lb. 8½@9 ¢
½-lb. papers .lb. 9 @9½¢
¼-lb. papers .lb. 9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye ₱ doz. $3.25
Ft. Madison Western ₱ doz. $4.00

Police Goods—

Manufacturers' Lists .25@25&5%
Tower's .25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ₱ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ₱ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ₱ doz., $3.00; No. 2 (1 qu.), $9.72 40%
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gro. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz., $1.25; ₱ gro., $12.00.
Barkeepers' Friend Metal Polish, ₱ doz., $1.75; ₱ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gr. $9.00
Black Kid Paste, 5 lb can .each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ₱ gr. $5.75 10%
Dixon's Plumbago ₱ lb 8¢
Fireside ₱ gr. $2.50
Gem, ₱ gr. $4.50 10%
Japanese ₱ gr. $3.50
Jet Black ₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail .each 70¢
Black Silk, ½ lb box ₱ doz. $1.00
Black Silk, 5 oz. box ₱ doz. $0.75
Black Silk, ½ pt. liq. ₱ doz. $1.00

Poppers, Corn—

1 qt., Square .gro. $9.00
1 qt., Round .gro. $10.00
1½ qt., Square .gro. $11.00
2 qt., Square .gro. $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts .each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled .40%
Tinned .35%

Powder—

In Canisters:
Duck, 1 lb .each 45¢
Fine Sporting, 1 lb .each 75¢
Rifle, ½-lb .each 15¢
Rifle, 1-lb .each 25¢
In Kegs:
12½-lb. kegs .$3.50
25-lb. kegs .$4.50
King's Semi-Smokeless:
Keg (25 lb bulk) .$6.50
Half Keg (12½ lb bulk) .$3.50
Quarter Keg (6¼ lb bulk) .$1.90
Case 24 (1 lb cans bulk) .$8.50
Half case (1 lb cans bulk) .$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Robin Hood Sm'less Shot Gun .50&20%

Presses—
Fruit and Jelly—

Enterprise Mfg. Co. 20@25%

Seal Presses—

Morrill's No. 1, ₱ doz., $20.00 .50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller .$21.00

Pullers, Nail—

Cyclops .50%
Miller's Falls, No. 3, ₱ doz., $12.00 33⅓&10%
Morrill's No. 1, Nail Puller, ₱ doz. $20.00 .50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 .50%
Pelican, ₱ doz. $9.00 .40&10%
Scranton, Case Lots:
No. 2B (large) .$5.50
No. 3B (small) .$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots, ₱ doz. $6.00
Diamond B, No. 3, case lots, ₱ doz. $5.50
Giant No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15 33⅓%
Staple Pullers .60%
Parrot Tack and Stub Puller, ₱ doz., 75c.; ₱ gro., $6.00

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz.	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Stowell's:
Ceiling or End, Anti-Friction .60&10%
Dumb Waiter, Anti-Friction .60&10%
Electric Light .60%
Side, Anti-Friction .60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in. .16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in. .16@19¢
Acme .1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 1, 2 in. ₱ doz. 50%
Grand Rapids All Steel Noiseless .50%
Ideal .70&10%
Niagara .1¾ in., 16¢; 2 in., 19¢
No. 26, Troy .1¾ in., 14½¢; 2 in., 16½¢
Star .1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern .60@60&10%
Pitcher Spout .80@80&10%
Wood Pumps, Tubing, &c. .45@50%
Barnes Dbl. Acting (low list) .50%
Barnes' Pitcher Spout .75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co. .$16.00
Daisy Spray Pump ₱ doz. $6.75
Flint & Walling's, Fast Mail Hand, (low list) .55%
Flint & Walling's Fast Mail (low list) .55&5%
Flint & Walling's Tight Top Pitcher .50%
National Specialty Mfg. Co., Measuring, $6.00 .30%
Mechanical Sprayer .$6.00
Myers' Pumps (low list) .50%
Myers' Power Pumps .50%
Myers' Spray Pumps .50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾ 4
	$3.30	3.60	3.85	4.10 4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—

Saddlers' or Drive, good .doz. 50@75¢
Spring, single tube, good quality .$1.75@2.00
Revolving (4 tubes) .doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive .50%
Bemis & Call Co.'s Check .55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00 .50%
Hercules, 1 die, each $5.00 .50%
Niagara Hollow Punches .40%
Niagara Solid Punches .55&10%
Steel Screw, B. & K. Mfg. Co. .50%
Tinners' Hollow, P., S. & W. Co. .40%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44 .60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾ in.	
$2.50	$3.00	$4.40	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$2.00	$2.70	$3.60	*100 feet.*

Sliding Door, Painted Iron .2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢ .30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ₱ ft. 5½¢
No. 2, Reliable Hgr. Track, ₱ ft. 7¢
Cronk's:
Double Braced Steel Rail..₱ ft. 2¾¢
O. N. T. Rail 2½¢
Griffin's:
xxx, ₱ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ₱ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ₱ 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T., ₱ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in. ₱ 100 ft. $4.00
Lawrence Bros.:
₱ 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ₱ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ₱ ft., 11¢ .50%
None Better ₱ ft. 3¾¢
Standard ₱ ft. 4 ¢
Myers' Stayon Track .60&10%
Richards' Mfg. Co.:
Common 1 x 3-6 in., $2.25; 1¼ x 3-16, $2.50; 1¼ x 3-16, $2.75.
Special Hinged Hanger Rail .60&10%
Lag Screw Rail, No. 65 .50%
Gauge Trolley Track, ₱ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢
Safety Door Hanger Co.'s Storm King Safety .60%
Safety Door Hanger Co.'s U. S. Standard .60%
Stowell's:
Cast Rail ₱ ft. 1¾¢
Steel Rail, Plain .25%
Wrought Bracket, 1 3-16 in. ₱ ft. 3¢
Wrought Bracket, 1¼ x 5-16.. ₱ ft. 7¢
Swett's Hylo, ₱ ft. 11¢ .60%
P. L. B. Steel Rail ₱ 100 ft. $3.00
No. 0, 1 x 3-16 ₱ 100 ft. $2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Fort Madison Red Head Lawn .$3.25
Fort Madison Blue Head Lawn .$2.70
Jackson Lawn, 29 and 30 teeth, ₱ doz., net .$4.25
Cronk's:
New Champion Garden, ₱ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00 .75%
Victor Garden, ₱ doz. 12 teeth, $15.00; 14, $16.50; 16, $18.00 .80%
Queen City Lawn, ₱ doz., 20 teeth, $3.45; 24, $3.60 .net.
Anticlog Lawn, ₱ doz. .$4.00
Malleable Garden .70&10%
Kohler's:
Lawn Queen, 20-tooth ₱ doz. $3.45
Lawn Queen, 24-tooth ₱ doz. $3.60
Paragon, 20-tooth ₱ doz. $2.75
Paragon, 24-tooth ₱ doz. $3.00
Steel Garden, 14-tooth ₱ doz. $2.40
Malleable Garden, 14-tooth, ₱ doz. $1.75@2.00
Weldless Steel Garden .75&5%

Rasps, Horse—

Disston's .75%
Heller Bros. .70&5@70&10&5%
McCaffrey's American St'd .60&10&5%
New Nicholson .70&10@75%
See also Files.

Razors—

Boras—I C. .60%
Fox Razors, No. 42.. ₱ doz. $20.00
Fox Razors, No. 44.. ₱ doz. $20.00
Fox Razors, No. 82, Platina... ₱ doz. $25.00
} 10 Dis. 40%
Red Devil .50%
A. H. Sage Co.:
Arbo Anti-Rust ₱ doz. $10 00
Herbrand ₱ doz. $6.00
Barber ₱ doz. $6.00
Silberstein:
Carbo Magnetic .$18.00
Griffon, No. 65 .$15.00
Griffon, No. 00 .$12.00
All other Razors .40%

Safety Razors—

Silberstein .40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo .20%
Aluminum, German Silv., Bronze .25%
1240 N, 124 N .20%
3004 N, 06 N, 6 RM, G 9 .25%
4 N, 6 PN, 24 N, 26 PN .20%
2904 P .33⅓%
2904 PN .33⅓%
0024 N .33⅓%
02084 N .33⅓%
002904 PN .33⅓%
802 N .33⅓%
986 PN, 2904 N, 974 PN .25%
5009 PN, 5009 N .20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR .20%
304 P, 304 PN, 00304 P, 00304 PN .33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed .70&10%
Bronzed .75%

Revolvers—

Single Action .95¢@$1.00
Double Action, except 44 cal. $1.85
Double Action, 44 caliber .$2.00
Automatic .$3.45
Hammerless .$4.00
Thayer, Robertson & Cary, Hammerless .each $3 25

NOTE.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in. .per doz. $2.25@$2.50
17 in. .per doz. $2.50@$2.75
18 in. .per doz. $2.75@$3.00

Rings and Ringers—
Bull Rings—

Steel	2	2½	*3 inch.*
	$0.70	0.75	0.80 *doz.*
Copper	$1.00	1.15	1.40 *doz.*

Rea's Improved Self-Piercing, Copper, 2 in., ₱ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes .$4.00@4.50
Hill's Ringers, Gray Iron .doz. 50@55¢
Hill's Ringers, Malleable Iron .doz. 70@75¢
Blair's Rings .per gro. $4.75@5.25
Blair's Ringers .per doz. $0.60@ .65
Brown's Rings .per gro. $5.00@5.50
Brown's Ringers .per doz. $0.60@ .65

Rivets and Burrs—

Copper .50&10@60%
Iron or Steel .75@75&5%

Rollers—

Acme, Stowell's Anti-Friction .50%
Barn Door, Sargent's list .60%
Cronk's Stay No. 65, $0.90; No. 50 .$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56 .$0.84
Lane's Stay .40%
Richards' Stay:
Handy Adj. and Reversible No. 53 .75¢
O. K. Adj. and Reversible No. 58 .50¢
Lag Screw, Nos. 55 and 57 .50%
Underwriters', Nos. 59, 60 .50%
Favorite, No. 54 .60%
Stowell's Barn Door Stay.. ₱ doz. $1.00
Swett's Anti-Friction .50%
Screw and Spike Stay ₱ doz. 65¢
Hinge Adjustable Stay ₱ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger: Pure .lb. 11½@12¢
Sisal, 7-16 in. diam. and larger: Mixed .lb. 8@8¼¢
Pure .lb. 9½@9¾¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .lb. 8@8¼¢
Pure .lb. 9½@9¾¢
Sisal, Tarred, Medium Lath Yarn: Mixed .lb. 7½¢
Pure .lb. 8½¢
Cotton Rope, on reels: Lb. Best, ¼-in. and larger .16½@18¢
Medium, ¼-in. and larger .15½@16¼¢
Common, ¼-in. and larger .10¢
In coils, ½¢ advance.
Jute Rope: Thread No. 1, ¼-in. & up. .lb. 6½¢

*Thread No. 2, ¼-in. & up, lb.*5¾¢
Old Colony Manila Transmission Rope ..... ℔ 17½¢

Wire Rope—
Galvanized ..... 42½&2½%
Plain ..... 50&2½%

Ropes, Hammocks—
Covert Mfg. Co.:
Jute 50%
Sisal ..... 30&10%
Covert Saddlery Works ..... 60&5%

Rulers, Desk—
Stimpson & Son:
Boxwood and Maple ..... 30&10%

Rules—
Boxwood ..... 60&10&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Flexifold ..... 37½&10&10&2½%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@10&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag 40%
Zig Zag, Pin Joint 42½%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band ..... 50&10@60%
Cross Cuts ..... 35&5%
Mulay, Mill and Drag 50%
One-Man Saw 40%
Wood Saws 40%
Hand, Compass, &c. 40%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 14 in. wide 60%
Band, ¼ to 1¾ 50%
Crosscuts 50%
Narrow Crosscuts 55%
Mulay, Mill and Drag 50%
Framed Woodsaws 35%
Woodsaw Blades 35%
Woodsaw Rods 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 127½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 35%
C. E. Jennings & Co.'s:
Back Saws 25%
Butcher Saws 30%
Compass and Key Hole Saws ..... 35&5%
Framed Wood Saws 30%
Hand Saws ..... 20&2½%
Wood Saw Blades 25%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 50%
Crescent Ground Cross Cut Saws 35%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 50%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 40%
Compass, Key Hole, &c. ..... 25@25&7½%
Wood Saws ..... 35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws ..... 40&10@50%
Butcher Saws Blades ..... 35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saws—
Atkins' Hack Saw Blades A A A A..25%
Disston's:
Concave Blades 25%
Keystone 40%
Hack Saw Frames 30%
Fitchburg File Works, The Best 35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades 40%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades 35%
Diamond Hack Saw Frames 50%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..10%

Scroll—
Barnes' No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $4.00 ..... 15&10%

Scalers, Fish—
Covert's Saddlery Works ..... 60&10%

Scales—
Family, Turnbull's ..... 50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... *doz. $5.50*
Two Platforms, ½ oz. to 8 lbs. ..... *doz. $16.00*
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales 50%
Chicago Scale Co.:
The "Little Detective" ..... 25 lbs 50%
Union or Family No. 2 ..... 60%
Portable Platform (reduced list) 50%
Wagon or Stock (reduced list) ..... 25@35%
"The Standard" Portables 50%
"The Standard" R. R. and Wagon 50%

Scrapers—
Box, 1 Handle ..... *doz. $2.00@2.25*
Box, 2 Handle ..... *doz. $2.60@2.85*
Ship ..... *Light, $2.00; Heavy, $4.50*
Adjustable Box Scraper (S. R. & L. Co.), $6.00 ..... 45%
Chapin-Stephens Co., Box, 30@30&10&10%

Screens, Window and Frames—
Air Line Pattern Screens ..... 60&10%
Flyer Pattern Screens ..... 60&10@60&10&5%
Maine Screen Frames ..... 40&10&5%
Perfection Screens ..... 60&10@60&10&5%
Phillips' Screen Frames ..... 60&5@60&10%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼, $3.50@3.75
Bench, W'd, Beech. doz. ..... 30@30&5%
Hand, Wood ..... 30@30&5%
R. Bliss Mfg. Co., Hand ..... 30@30&10%
Chapin-Stephens Co., Hand ..... 30@30&10%
Ohio Tool Co., Bench and Hand 30%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 ..... 75&17½&10%
Coach, Gimlet Point, list Oct. 1, '99 ..... 75&12½&10%
Hand Rail, list Jan. 1, '81 ..... 70&10@75%

Jack Screws—
Standard List ..... 75&10@80&5%
Millers Falls ..... 50&10&10%
Millers Falls, Roller ..... 50&10%
P., S. & W 50%
Sargent ..... 70&10%
Swett Iron Works ..... 75&10@80&5%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron ..... *50@50&10%*
Flat or Round Head, Brass ..... *50@50&10%*

Set and Cap—
Set (Iron) 80%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap 75%
Hex. Hd. Cap 75%
Rd. Hd. Cap ..... 60&10%
Fillister Hd. Cap ..... 60&10&10%

Wood—
List July 23, 1903.
Flat Head, Iron ..... 87½&10@.. %
Round Head, Iron ..... 85 &10@.. %
Flat Head, Brass ..... 85 &10@.. %
Round Head, Brass ..... 80 &10@.. %
Flat Head, Bronze ..... 77½&10@.. %
Round Head, Bronze ..... 75 &10@.. %
Drive Screws ..... 87½&10%

Scroll Saws—
See *Saws, Scroll.*

Scythes— *Per doz.*
Prices announced for next season:
Clipper Pattern, Grass *$6.20*
Full Polished, Clipper *$6.75*
Grain *$8.00*
Clipper, Grain *$8.25*
Weed and Bush *$6.25*

Seeders, Raisin—
Enterprise ..... 25@30%

Sets— Awl and Tool—
Aiken's Sets, Awl and Tools:
No. 29, ℔ doz., $10.00 ..... 60&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00

Sets, Nail—
Octagon ..... *gro. $3.50@3.75*
Buck Bros. 27½%
Cannon's Diamond Point, ℔ gro. $12.40%
Mayhew's ..... ℔ gro. $9.00
Snell's Cor'gated, Cup Pt. ..... ℔ gro. $7.20
Snell's Knurled, Cup Pt. ..... ℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—
Regular list ..... 75@75&10%

Saw—
Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut 30%
Plate 20%
Disston's Star and Monarch 25%
Morrill's No. 1, $15.00 ..... 50%
Nos. 3 and 4, Cross Cut, $20.00 ..... 50%
No. 5, Mill, $30.00 ..... 50%
Nos. 10, 11, 95, $15.60 ..... 50%
No. 1 Old Style, $10.00 ..... 50%
Special, $16.7 ..... 50%
Giant Royal Cross Cut ..... ℔ doz. $8.00
Royal, Hand ..... ℔ doz. $4.50
Taintor Positive ..... ℔ doz. $6.75

Shaving—
Fox Shaving Sets, No. 20 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co. 70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz. $1.50
Mounted Kitchen Sand Stone, ℔ doz. $1.50
Natural Grit Carving Knife Hones, ℔ doz. $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz. $1.50
Quick Edge Pocket Knife Hones, ℔ doz. $2.50
} 40%

Skate—
Smith & Hemenway Co. 20%

Shaves, Spoke—
Iron ..... *doz.$1.10@1.25*
Wood ..... *doz.$1.75@2.25*
Bailey's (Stanley R. & L. Co.) 45%
Razor Edge (Stanley R. & L. Co.) 35%
Chapin-Stephens Co. ..... 30@30&10&10%
Goodell's, ℔ doz. $9.00 ..... 15&10%
Wood's F1 and F2 ..... 50%

Shears—
Cast Iron..	*7*	*8*	*9 in.*	
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap ..... *70@70&10%*
Best quality, Nickel ..... *60@60&10%*
Fair quality, Jap ..... *80@80&5%*
Fair quality, Nickel ..... *75@7"&10%*
Tailors' Shears ..... *40@40&10%*
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson's Sheep, 1900 list ..... 50&10%

Tinners' Snips—
Steel Blades ..... *20&5@20&10%*
Steel Laid Blades ..... *40&10@50%*
Forged Handles, Steel Blades, Berlin, 50@50&5%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in. 50%
Niagara Snips 40%
P., S. & W. Forged Handles 20%

Pruning Shears—
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades ..... 50&10%
P., S. & W. Co. 33⅓%
Wilkinson's Hedge, 1900 list ..... 50&10%
Wilkinson's Lawn and Border 50%

Sheaves— Sliding Door—
Stowell's Anti-Friction 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 40%
R. & E. list 33⅓%
Wrightsville Hatfield Pattern 80%

Sliding Shutter—
Reading list 40%
R. & E. list 33⅓%
Sargent's list ..... 10&10%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge ..... 65&10%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge. 25&10%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge ..... 20&5%
Climax, Union, League, New Rival, 10 and 12 gauge ..... 25&5%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ..... 20&5%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge ..... 33⅓&5%
Robin Hood, Low Brass ..... 20&10%
Robin Hood, High Brass ..... 30&10%

Shells, Loaded—
Loaded with Black Powder *40%*
Loaded with Smokeless Powder, medium grade ..... *40&5%*
Loaded with Smokeless Powder, high grade ..... *50&10&10%*
Robin Hood Smokeless Powder:
Robin Hood, Low Brass 50%
Comets, High Brass ..... 50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron ..... *per keg $4.00*
Steel ..... *per keg $3.75*
Burden's, all sizes ..... ℔ keg $3.90

Shot—
Drop, up to B, 25-lb. bag *$1.70*
Drop, B and larger ..... *per 25-lb. bag, $1.95*
Buck, 25-lb. bag *$1.95*
Chilled, 25-lb. bag *$1.95*

Shovels and Spades—
Association List, Nov. 15, 1902. 40%

Sieves and Sifters—
Hunter's Imitation ..... *gro. $10.50@11.00*
Hunter's Genuine ..... *per gro. $12.00@12.50*
Buffalo Metallic Blued, S. S. Co., ℔ gr.:
14&16 ..... $13.20
16&18 ..... $13.50
18&20 ..... $14.40
Shaker (Barler's Pat.) Flour Sifters, ℔ doz. $2.00 ..... 20%

Sieves, Seamless Metallic
	Per dozen.			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... *doz. $0.90@0.95*
Mesh 20, Nested ..... *doz. $1.00@1.05*
Mesh 24, Nested ..... *doz. $1.30@1.40*

Sinks, Cast Iron—
Standard list ..... *60@60&10%*
Barnes' low list ..... 60&5%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron ..... *80&10@80&10&10%*
Steel ..... *40@40&10%*

Slates, School—
Factory Shipments.
"D" Slates ..... *50@50&10%*
Eureka, Unexcelled Noiseless ..... *60&5 tens*
Victor A, Noiseless ..... *60&4 tens &5%*

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German ..... *40@40&10%*
Covert Mfg. Co.:
Derby ..... 30&2%
High Grade 40%
Jockey 35%
Trojan 45%
Yankee ..... 30&2%
Yankee Roller ..... 30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Harness Snaps, 1 inch ..... 60&5%
Swivel Snaps 60%
Swivels 50%
Sargent's Patent Guarded ..... 66⅔&10%

Snaths—
Scythe *50%*

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality ..... *50&10@60&5%*
Cheap ..... *60@60&10%*
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous—
German Silver ..... *60@60&5%*
Cattaraugus Cutlery Co.:
Seneca Silver 50%

Tinned Iron—
Teas ..... *per gro. 45@50¢*
Tables ..... *per gro. $0.50@$1.00*

Springs— Door—
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 25%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 39 in. ..... ℔ doz. $1.10
Victor (Coil) ..... 50&10&10%

Carriage, Wagon, &c.—
1¼ in. and Wider: *Per lb*
Black ..... *4@4¼¢*
Half Bright ..... *4@4¼¢*
Bright ..... *4½@4¾¢*
Painted Seat Springs:
1½ x 2 x 26 ..... *per pr. 42¢*
1½ x 3 x 28 ..... *per pr. 70¢*

Sprinklers, Lawn—
Enterprise ..... 25@30%
Philadelphia, No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24 ..... 30%

Squares—
Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron. } *75&5@75&10%*
Rosewood Hdl. Try Square and T-Bevels ..... *60&10&10@70%*
Iron Hdl. Try Squares and T-Bevels ..... *40&10@40&10&10%*
Disston's Try Sq. and T-Bevels 70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2 ..... 50%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz. $1.00*
Good Grade ..... *doz. $1.25*
Tinned Iron ..... *doz. $0.75@1.25*
Iron, Porcelain Lined ..... *doz. $1.75*

Staples—
Barbed Blind ..... *lb. 6@6½¢*
Electricians', Association list ..... *80&10&10&10%*
Fence Staples, Plain, $2.25; Galvanized *$2.55*
Poultry Netting Staples ..... *per lb. 3¼@3¼¢*
Grand Crossing Tack Co.'s list ..... 80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros. 30%
C. & A. Hoffmann's 40%

Steelyards— ..... 30@30&10%

Stocks and Dies—
Blacksmiths' ..... *50@50&10%*
Curtis Rev'ble Ratchet Die Stock 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—
Enterprise ..... 25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit 60%
Gem Corundum Axe, Single or Double Grit 60%
Gem Corundum Slips 60%
Gem Corundum Razor Hones 50%
Pike Mfg. Co., 1904 list: ℔ lb. 33⅓%
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 9 in. $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 30¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 33⅓%

Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%
Hindostan No. 1, R'g'lar. ₱ lb 8¢
Hindostan No. 1, Small.. ₱ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, Extra, 5 to 8 in.....₱ lb 80¢ } 33⅓%
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips.....40¢
Sand Stone.....6¢

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ₱ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots.....₱ gro. $9.00
One gross or more.....₱ gro. $7.20
Lots of 10 gross or more..₱ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S..₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S.₱ gro. $9.00
Green Mountain S. S.₱ gro. $6.00
Extra Indian Pond S.S.₱ gro. $7.50
No. 1 Indian Pond S.S.₱ gro. $7.00
No. 2 Indian Pond S.S.₱ gro. $4.50
Leader Red End S. S.₱ gro. $4.50
Quick Cut Emery....₱ gro. $10.00
Pure Corundum,.....₱ gro. $18.00
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓% } 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....33%

Straps— Box—

Cary's Universal, case lots..20&10&10%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket .....doz. $1.60
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902.....30&5%

Sweepers, Carpet—

National Sweeper Co.: ₱ doz.
Louis XV, Roller Bearing, Gold Plated.....$120.00
Hepplewhite, Roller Bearing, Silver Plated.....$72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered.....$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled.....$36.00
National Queen, Roller Bearing, Fancy Veneers.....$27.00
Loyal, Roller Bearing, Veneers, Nickeled.....$25.00
Triple Medal, Roller Bearing, Nickeled.....$24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled.....$24.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'r'gs, N'kel.$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled.....$36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned.....$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled.....$54.00
Mammoth (30 in. case), Roller Bearing, Nickeled.....$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire.....₱ doz $25.00
Model A, Sterling.....₱ doz. $25.00
Model B, Sterling, Nickeled..... ₱ doz. $23.00
Model B, Sterling, Japanned..... ₱ doz. $21.00
Model C, Sterling.....₱ doz. $21.50
Model D, Sterling.....₱ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.
American Carpet Tacks..90@87½%
American Cut Tacks....90@87½%
Swedes Cut Tacks.....90@87½%
Swedes Upholsterers' Tacks... 90&50%
Gimp Tacks.....90&50%
Lace Tacks.....90&50%
Trimmers' Tacks.....90@87½%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&50%
Hungarian Nails.....85%
Finishing Nails.....70%
Trunk and Clout Nails....80&5%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50&10@60%
See also Nails, Wire.

Tanks, Oil— * Each.

Emerald, S., S. & Co.....30-gal. $3.40
Emerald, S., S. & Co.....60-gal. $4.25
Queen City, S., S. & Co....30-gal. $3.65
Queen City, S., S. & Co....60-gal. $4.50

Tapes, Measuring—

American Asses' Skin..50@50&10%
Patent Leather.....25@30&5%
Steel .....40@40&10%
Chesterman's .....25@25&5%
Eddy Asses' Skin.....40&10@50%
Eddy Patent Leather.....25@30&5%
Eddy Steel.....40@40&10%
Keuffel & Esser Co..
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list..... 35@35&5%
Pocket .....35@35&5%
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers.....50%
Stowell's Hay Forks.....50%
Stowell's Fork Pulleys.....50%

Miniature—

Smith & Hemenway Co.'s.....25%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Oneida Pattern...75&10@75&10&5%
Newhouse .....45@45&5%
Hawley & Norton.....65%
Victor .....70&10%
Oneida Community Jump.....50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ₱ doz. $13.25
No. 3, Rat, ₱ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ₱ doz. $5.25; case of 72 ₱ gro. $4.70 doz.
No. 4, Mouse, ₱ doz. $3.65; case of 150 $3.00 doz.
No. 5, Mouse, ₱ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Kohler's Steel Garden Trowels, 5 in. ₱ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ₱ gro. $6.00
Never-Break Steel Garden Trowels.. ₱ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....₱ doz. $16.00
Grocery .....₱ doz. $15.00
Daisy Stove Trucks, Improved Pattern .....₱ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....₱ doz. $18.50

Tubs, Wash—

No.	*1*	*2*	*3*
Galvanized, per doz.	*$4.25*	*4.75*	*5.25*
Galvanized Wash Tubs (S., S. & Co.): No.	1	2	3
	10	20	30
Per doz., net.	$5.70	6.30	7.20
	6.60	7.20	8.10

Twine, Miscellaneous—

Flax Twine:	*BC.*	*B.*
No. 9, ¼ and ½-lb. Balls	*22@24¢*	
No. 12, ¼ and ½-lb. Balls	*18@20¢*	
No. 18, ¼ and ½-lb. Balls	*16@18¢*	
No. 24, ¼ and ½-lb. Balls	*16@18¢*	
No. 36, ¼ and ½-lb. Balls	*15@17¢*	
Chalk Line, Cotton Balls	*½-lb. 25@30¢*	
Cotton Mops, 6, 9, 12 and 15 lb. to doz.	*10@18¢*	
Cotton Wrapping, 5 Balls to lb., acording to quality...	*11½@20¢*	
American 2-Ply Hemp, ¼ and ½-lb. Balls	*13@14¢*	
American 3-Ply Hemp, 1-lb. Balls	*13@14¢*	
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)	*8½¢*	
India 3-Ply Hemp, 1-lb. Balls	*8½¢*	
India 3-Ply Hemp, 1½-lb. Balls.	*7@8¢*	
2, 3, 4 and 5-Ply Jute, ½-lb. Balls	*5@10¢*	
Mason Line, Linen, ½-lb. Bls.	*46¢*	
No. 26½ Mattress, ¼ and ½-lb. Balls	*37¢*	
Wool, 3 to 6 ply....B 5½¢; A 6¢		

Vises—

Solid Box.....60&10@60&10&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting.....25@25&5%
Tiger Machinists'.....40%
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists' .....40@40&5%
Keystone .....65&5@70%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch 50%
Solid Jaw.....50%
Merrill's 20%
Millers Falls.....60&10%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip.....20%
Parker's:
Victor .....20@25%
Regulars .....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss .....20@25%
Sargent's 40%
Snediker's X. L.....33⅓%
Stephens' 33⅓%
Williamson Mfg Co, Double Swivel.. 40&5%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz. $30.....25%
Perfection Saw Clamps, ₱ doz....$4.50
Heading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip.....15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise .....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870 .....40%
Williamson Mfg. Co. Double Swivel Combination Pipe.....40&5%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Dis. 15%
Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 55%
Ground 60%
Plain or Unground.....65%
Country Hollow Ware, per 100 lbs.....$2.75
White Enameled Ware:
Maslin Kettles.....70%
Covered Wares
Tinned and Turned.....40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each....	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&c&50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.90
Cable Cross, family size, stationary protector.....$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back.....$2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.25

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ⅞ 10¢ 1 11¢ 1⅛ 12¢ 1¼ 13¢ Inch. per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers ...$5.20 4.30 3.00 2.80 2.60
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 .....50&10%

Wedges—

Oil Finish.....lb. 2.15@2.30¢

Weights—Hitching—

Covert Mfg. Co.....40&2%
Covert's Saddlery Works.....60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District.....$25.00
Southern Territory..$19.00@20.00
Western and Central Districts .....$20.00@21.00

Wheels, Well—

8-in., $1.50@1.55; 10-in., $1.75@1.70; 12-in., $2.25@2.35; 14-in., $3.40@3.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80&5@80&7½%
10 to 18.....80@80&5%
19 to 26.....80&10@80&10&5%
27 to 36.....80&5@80&10%
Galvanized:
6 to 9.....77½@77½&5%
10 to 14.....72½@72½&5%
15 to 16.....75&7½@75&10&2½%
19 to 26.....75&5@75&10%
27 to 36.....72½&5@72&7½%
Coppered:
6 to 9.....77½@77½&5%
10 to 14.....77½@77½&7½%
15 to 18.....75&10@75&10&2½%
19 to 26.....75&10&5@80%
27 to 36.....75@75&5%
Tinned:
6 to 14.....77½@77½&7½%
15 to 18.....75&5@75&10%
Annealed, Steel and Tinned, on Spools ..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&5@60&10&5%
Brass, list Feb. 26, '96.....30%
Copper, list Feb. 26, '96.....10%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, 1903..90&25@90&30%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&15@80&17½%
Painted Screen Cloth, 100 ft., $1.20
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft..3 ¢
Nos. 4 and 5 Mesh, sq. ft..3½¢
No. 6 Mesh, sq. ft.....3½¢
No. 8 Mesh, sq. ft.....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ....75&10@75&10&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern.....70%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....40%
Adjustable S Pipe.....40%
Bemis Pipe.....60%
Briggs Pattern.....40%
Combination Black.....40&5%
Combination Bright.....40%
Merrick Pattern.....50
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle .....50&10%
Elgin Wrenches, ₱ doz.....$6.25
Elgin Rethreading Attachment, one die, ₱ doz.....$6.25
Elgin Extra Dies, ₱ doz.....$3.00
Elgin Extra Jaws, ₱ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ₱ doz.....$2.10
Gem Pocket.....30%
Hercules 70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
Improved Pipe (W. & B.).....60%
Solid Handles, P., S. & W...50&10@60
Stillson 65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₱ gross, $7.50; ₱ doz.....$0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ₱ doz.....$48.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '02.....90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed..70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lbs., $7.75@8.00